

Chemical Operations

Principles and Fundamentals



U.S. Marine Corps

P R E F A C E

FM 3-100 is the Chemical Corps capstone manual. It describes the principles and fundamentals of chemical operations in support of Army operations. It applies to operations during war — combat operations under nuclear, biological, and chemical (NBC) conditions — and operations other than war.

It is intended for chemical leaders and staff officers. However, it is also appropriate for other branches and services as a basis for policies and procedures.

This manual describes the principles and fundamentals of the chemical mission areas — NBC defense, smoke, non-lethal, and flame operations. It provides general guidance for the employment of chemical units and chemical personnel on the modern battlefield. It discusses chemical doctrinal concepts in relation to Army operations doctrine. The supporting tactics, techniques, and procedures are provided separately in the 3-series FMs (chemical field manuals).

To use this manual effectively the reader must understand the terms——

- Weapons of mass destruction.
- NBC defense.
- Integrated warfare.
- Battlefield nuclear warfare (BNW).
- NBC conditions.

Briefly, weapons of mass destruction are weapons that through use of or threat of use can cause large-scale damage and contamination, shifts in objectives, phases, and courses of action. NBC weapons are weapons of mass destruction.

NBC defense consists of measures which enable friendly forces to survive, fight, and win against enemy use of nuclear weapons, biological or chemical agents. US forces apply NBC defensive measures before and during integrated warfare. In integrated warfare, opposing forces employ nonconventional weapons along with conventional weapons. NBC weapons are nonconventional

The term “BNW” describes combat where one or both combatants possess nuclear weapons. The combatants may or may not have employed these weapons. BNW encompasses the pre-nuclear and post-nuclear phases as well as active nuclear warfare. Under BNW, forces take nuclear defense measures such as dispersion against possible enemy nuclear strikes.

Similarly, the term “NBC conditions” describes combat where one or both combatants possess nonconventional weapons. The combatants may or may not have employed these weapons, but the capability exists. Under NBC conditions forces must take a full range of NBC defensive measures to counter possible enemy NBC attacks.

FM 3-100 describes US combat operations under NBC conditions. It is divided into four parts:

Part One, The NBC Challenge. This part describes the NBC combat environment, US policy, and NBC fundamentals of the Army operations.

Part Two, Operational Principles. This part describes the basic principles of battle management, NBC defense, and smoke. It describes the use of, and defensive against, flame and incendiary devices.

Part Three, Planning and Organization. This part describes the Chemical Corps role in planning combat operations. It discusses chemical organizations and organizational principles. It further explains sustainment planning for chemical units and the chemical mission.

Part Four, Combat Operations. This part describes offensive and defensive operations under NBC conditions. It describes NBC defense, smoke, non-lethal, and flame considerations in joint, combined, contingency, and special operations.

This manual incorporates findings from the Combined Arms in a Nuclear/Chemical Environment (CANE) Force Development Testing and Experimentation series of evaluations. These findings depict how combat forces are impacted during extended operations under NBC conditions.

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Unless otherwise stated, whenever the masculine gender is used, both men and women are included.

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Chemical Operations Principles and Fundamentals

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The NBC Challenge
Chapter 1

Understanding NBC Warfare

"Whether or not GAS will be employed in future wars is a mater of conjecture, but the effect is so deadly to the unprepared that we can never afford to neglect the question."

**--Final Report of general John J. Pershing,
Commander-in-Chief,
American Expeditionary Forces, 1920**

The end of the Cold War and the disintegration of the Warsaw Pact introduced a complex strategic environment. That environment is multi-polar, interdependent, and regionally oriented. Emerging powers are rapidly transforming the strategic landscape and exhibiting new trends. One such trend is the changing nature of regional conflict. It is an alarming prospect that developing nations, with hostility towards the US, may have nuclear, biological, and chemical (NBC) munitions — weapons of mass destruction (WMD). The growth of these weapons increases the chance that many nations could use them. So, potential use of WMD dramatically alters the nature of regional conflict across the continuum of operations.

The premises of the Cold War, rooted in superpower adversarial relationships, give way to a new strategic pragmatism based on diversified, regional threats that may have WMD. Some experts argue that reducing WMD in the arsenals of major world powers lessens the likelihood of their use. This seems applicable only in the context of global conflict, a diminishing probability in these momentous times. We must consider the use of WMD as we have no assurance that we shall face a nation that has them.

The US can no longer intervene in regional conflicts involving use — or potential use — of WMD. We cannot reasonably expect their use to cease simply because our forces arrive. To the contrary, the belligerent who has the most to lose — or the most

antipathy toward the US — may use WMD to escalate the conflict. So, potential use of these weapons has become a major cause of destabilization in regional conflict.

The lessened chance of global confrontation and a concomitant rise in regional instability and conflict are new realities. We cannot say the threat of WMD in Europe is extinct. We can only say that it is lessened by the contemporary political climate. While traditional superpowers no longer have political aims that would justify using these weapons, widespread growth in developing nations increases their likelihood of use.

The growth of WMD in the developing nations is an arms race within an arms race. Major world powers continue to reduce their inventory of conventional weapons and WMD. However, a significant number of developing nations maintain ambitious arms programs. These programs are designed to enhance

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conventional weapons capabilities and develop or improve their capability to use WMD.

The developing nations arms race is multi-dimensional, manifesting itself in vertical and horizontal growth. Vertical growth, the more traditional form, occurs as nations known to have NBC capability help their allies and client states. Horizontal growth proceeds as regional powers try to get weapons and technology, through development and/or purchase. WMD, growing throughout developing nations, present a danger we must contend with in assessing the new strategic environment. One serious result of such growth is the chance that WMD may fall into the hands of terrorists.

Terrorism is the threat of coercive violence for political ends. Practiced by nations, groups, or individuals, it takes on an entirely new perspective with the potential use of NBC weapons. We are aware that nations known to support international terrorism seek to become regional nuclear powers.

During the Cold War, possible possession of nuclear weapons by these nations raised no significant alarm. Their use against the continental US seemed an impossibility. The perspective is much different as our focus turns from force projection to regions of conflict. Furthermore, the international community's informal policy of benign growth — looking the other way --on nuclear arms in the developing nations seems in continuance. An analysis of current growth rates reveals that over the next 30 years more than 40 nations could produce nuclear weapons. Many more may have biological and chemical weapons.

PROLIFERATION OF WEAPONS OF MASS DESTRUCTION

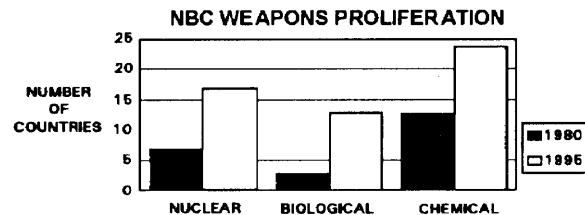
The growth of WMD dramatically alters the nature of regional conflict. While the Army removes NBC weapons from its arsenal, other nations are getting them at an alarming rate. At any stage of build-up, during hostilities, and even during redeployment operations, US forces may come under attack by NBC weapons. Planning and training for operations in such an environment are urgent. No one should ignore the risks associated with WMD.

It is not the sheer killing power of WMD that signifies the greatest effect. It is the strategic, operational, psychological, and political impact of their use. The presence of these weapons will dramatically influence public opinion. This impacts

on the decisions of policy makers at the strategic level, as well as commanders at the operational and tactical level. Introduction of forces into regional conflicts will become increasingly risky due to the potential use of WMD.

Many regional powers have the capability to escalate a conflict well beyond the tactical level and immediately raise the stakes of our involvement. Rapid response and a swift end to the conflict will partially negate the potential rise in the use of these weapons.

The effective combination of active and passive operations is a prerequisite to nullify use of WMD by



*Figure 1-7. Proliferation of NBC weapons
1980 VS. 1995.*

an adversary. Active measures include raids, strikes, and operations designed to locate and neutralize the threat of these weapons. Passive measures include adapting proactive NBC defense measures and planning for an effective air and ballistic missile defense to counter NBC weapon delivery systems. A significant consideration is an adversary's willingness to use these weapons and the conditions that would prompt him to do so. A clearly viable operational concept might defeat enemy forces, but result in the use of WMD. This would negate any national policy gains or potential for early conflict termination. As the scope and nature of conflict changes, so to do the objectives and outcomes.

Nuclear

Regional conflict will expand as the integration of ballistic missile technology and nuclear warhead technology proliferate in the developing nations and provide new challenges for deterrence. Basic nuclear technology, now over 40 years old, is readily available to any nation, group, or individual seeking it. The growth of ballistic missiles in the developing nations is of paramount importance as it couples the

conventional arms race to WMD. Ballistic missiles, some with the potential to adapt warheads, are in the inventories of more than a few nations. The growth of nuclear weapons expands the scope and nature of conflict, increasing the risk of escalation.

The integration of nuclear weapons and long-range ballistic missile systems expands the scope of regional conflict. Ballistic missiles significantly reduce reaction time. They create complex planning and decision criteria for power-projection forces. Some developing nations have the ability to use WMD at extended range using ballistic missiles. This significantly enhances their effectiveness as instruments of terror against unprotected targets.

With the ability of nations to use missiles at extra-regional targets comes the possibility of conflict escalation beyond the boundaries of the recognized region. Any attempt to expand conflict by attacking other nations is clearly an escalator act.

Long-standing conflicts between adversaries will take on new dimensions as enhanced ballistic missile technology and growth of WMD continue to coalesce.

Intervention before or during a conflict involving nuclear weapons requires a detailed assessment of the value of the interests involved and potential costs in terms of casualties and political outcomes. Campaign planners advise the commander on an adversary's capability to use nuclear weapons and under what conditions he is most likely to do so. A critical planning consideration is to create force dispositions that do not provide lucrative targets for nuclear weapons.

The immediate effects of nuclear detonation are blast, thermal radiation, initial nuclear radiation, and electromagnetic pulse (EMP). These effects can cause significant personnel and materiel losses. Secondary effects include urban devastation, fires, and radiological contamination. EMP can cause a severe degradation of command, control, communication, and intelligence systems. Residual radiation can have long-term effects on personnel, equipment, facilities, terrain, and water sources.

Biological

The US has renounced the use of biological weapons. Many other nations have not. Still others have shown a willingness to ignore treaty commitments in this area. The availability of biological weapons (BW) to possible adversaries requires our forces to prepare for operations in a biological environment. BW involves the use of living organisms or the by-products of an organism, such as toxins. Such organisms or toxins

attack the human body and either kill or render that body ineffective. While the effects of BWs vary by type of organism or toxin used, their characteristics for use are similar. Biological agents, created to be highly infectious, ensure death or disablement, and are relatively simple to introduce over large areas.

Because of the perceptions caused by the use of BWs, psychological and political attitudes would be strongly affected. Military forces would, of course, be at risk. But the potential for grievous collateral damage is enormous. So, defensive measures — both active and passive — would be necessary to mitigate the effects of a biological attack. Populations — both military and civilian — would need informational, psychological, and medical preparation.

Chemical

All current and future operations have the potential to occur in a chemical environment. The US has renounced use of lethal or incapacitating chemical munitions. However, the first choice among WMD by other nations or terrorists groups may most likely be chemicals. Proper preparation for operations in a chemical environment is deterrence. Deterrence limits many of the possible advantages of an adversary's use of these weapons. Use of chemicals also poses a special dilemma. The measures we take to cope with them are militarily degrading.

Chemical weapons produce immediate and delayed effects that will hamper operations through the contamination of individuals, equipment, supplies, and critical terrain features. Commanders must constantly monitor the current and future situation through NBC recon and include NBC considerations in the intelligence preparation of the battlefield (IPB) process. Commanders use these tools to determine the best mission-oriented protective posture (MOPP) to mitigate the effects of any possible chemical use. NBC contamination avoidance (including NBC recon), protection, and decon are three planning imperatives for all future missions. Training for an NBC environment must be emphasized.

WEAPONS OF MASS DESTRUCTION: THE ENVIRONMENT

Extensive casualties and damage can occur very quickly in an environment where WMD are used. Shock and confusion control those who are not adequately trained and equipped. Defensive measures

(for example, wearing protective clothing, responding to alarms) and the cumulative effects of exposure to nuclear radiation or chemical agents affect performance. So, long-term operations in this environment will degrade performance.

Battle command will be more difficult. Command posts and headquarters at all levels may become significant targets. Control will be difficult even in the smallest unit as personnel in protective clothing will be hard to recognize and slower to respond to rapid changes in mission. Only cohesive, disciplined, physically fit, and well-trained units can function in these environments.

The use of WMD will dramatically alter the tempo of combat. When in conflict with an adversary who has these weapons, our forces must operate in full awareness that these weapons may be used at any time. We can never assume that we are immune from such attack. Commanders must act to accomplish the mission while minimizing acceptable risk.

Weapons of Mass Destruction
Weapons that through use or the threat of use can cause large-scale shifts in objectives, phases, and courses of action.
FM 100-5 Operations, 1993

Combined and coalition operations become more risky with the threat of WMD. Strong NBC defense readiness supports deterrence and should reduce the likelihood that an adversary will attack coalition members. Effective identification, detection, and warning systems within the theater further increase force readiness. However, many countries are not prepared for or protected from the use of WMD. So, they may become the primary target of an enemy's use of WMD to disintegrate a coalition. We will have to consider that possibility in all our operational and tactical planning.

Continuous intelligence preparation of the theater takes on new significance in locating and assessing the probability of use of WMD. The integration of national, joint, and combined intelligence means will be a prerequisite for intervention in a regional conflict.

The primary effects of the use of WMD would most likely be—

- Extensive casualties against an unprotected force. This is particularly crucial for allies or coalition members who may be less protected than our forces.
- Degraded command and control, and effectiveness

of weapons and vehicles.

- Restricted use of supplies, weapons, and equipment due to contamination.
- Enhanced effects of other munitions.
- Reduced speed, cohesion, and flexibility of movement.
- Restricted or denied use of key terrain.
- Increased need for dispersion and negated advantages of concentration.
- Escalated conflict and creation of a more difficult environment for conflict termination and post-conflict activities.
- Psychological impact of mass casualties and operations for extended periods in protective equipment.
- Allocation of significant combat power in countering or defeating enemy weapons and delivery systems.
- Psychological impact through the threat of use.

NBC CHALLENGES FOR US FORCES

The doctrine of many potential enemies of the US calls for the wartime use of NBC weapons. These weapons require specific responses. Under NBC conditions, US commanders must take a full range of NBC defensive measures. For example, under nuclear conditions US commanders must disperse their forces and take protective measures against possible fallout or further nuclear attack. US forces must continually prepare for an enemy nuclear strike that could defeat conventional forces or preempt a US decision to use nuclear weapons. Similarly, an enemy can use chemical or biological weapons at any level of war to degrade US forces. CANE Evaluation Report, Phase I, gives the impact of such use:

"The nature of the direct fire battle changes dramatically (under NBC conditions) . . . It takes the platoon almost twice as long to complete an attack and, even though the battle is much less intense firing rates decline by 20% in the defense and 40% in the attack), nearly twice as many men are required for a successful attack . . . The number of casualties suffered per enemy defender killed increases by 75%. APC losses double . . . Of those shots fired, almost 20% are fired at friendly personnel (fratricide) . . . It is more difficult to locate targets accurately and radio calls for fire take longer... Leaders at all levels indicated that they did not have time to accomplish all their duties (because of added duties such as supervision of NBC activities) . . . Leaders reported severe degradation in their ability to direct fire and

maneuver . . . Communications were degraded by at least 50% . . . transmission times during the battle increased by more than 100% . . . the number of camouflage actions decreased by 39% (as fatigue and frustration overcame sound tactical practices)."

US forces must prepare to fight and win under these conditions. This chapter describes the threat and the US national response. The remainder of the manual describes the doctrinal principles used by commanders and leaders to conduct combat operations under NBC conditions.

"...we could all be dying right now because we were not prepared to do our mission (under NBC conditions)."

**Mortar Platoon Sergeant
Light Infantry Company
Light Forces CANE Field Test
Fort Hunter Liggett, 1992**

PROTECTING THE FORCE

Force protection is crucial. Units will survive in a WMD environment only by anticipating the use of such weapons.

Training and equipping forces to operate on a contaminated battlefield are the principal keys to force survival. Dispersion of forces and installations, maintaining tactical and operational mobility, and planning for rapid reorganization of forces are a few other protection considerations. The likelihood of use of these weapons against our forces – not necessarily against our territory -- is greater than ever before. Enhancement of force protection by use of all available measures will reduce incentives for use of WMD by an adversary. Force protection imperatives are—

- Training. Ability to perform tasks will be reduced. Increased training is required to compensate.
- Maintaining alertness. Commanders at all levels must be constantly alert to the use of these weapons. They must balance risk against mission requirements and adjust their MOPP level without losing momentum.
- Developing leaders. Leaders are the most critical component in force protection. Confident, competent leaders make the difference in such a complex environment.
- Instilling discipline. Units must continue their

missions in spite of the use of such weapons by an adversary. Personnel must be adequately trained, properly equipped, and psychologically prepared for the effects of NBC weapons.

- Avoiding detection. Units must use active and passive measures to negate both mechanical and human acquisition means. The combination of active and passive force protection measures will significantly reduce any advantage gained by WMD.
- Retaining mobility. Tactical, operational, and strategic mobility will enhance chances for survival. commanders at all levels must consider displacing or dispersing whenever the threat of nuclear weapons is imminent.
- Dispersing of forces and installations to minimize potential damage. Commanders will disperse forces based on an adversary's ability to use WMD. The extent of dispersion will depend on METT-T (mission, enemy, terrain, troops, and time available). Dispersion will include plans for massing forces quickly once there is a reduction in risk of use of WMD. The commander will determine the type and size of maneuver forces and the timing for their concentration. Troop concentrations should be brief, deception of the highest quality, and plans sufficiently flexible to accommodate sudden changes. Operations should be swift and violent to take advantage of concentration.
- Using terrain for cover and shielding. Careful use of natural terrain shields personnel and equipment from the effects of NBC weapons.
- Ensuring logistical preparedness. Combat service support personnel and installations will disperse while continuing to sustain the force. Units must have sufficient supplies, protective clothing, decon, and medical supplies to continue operations without immediate need for resupply.
- Planning for reorganization. Commanders must anticipate the need to reorganize units following the use of WMD. Prompt damage assessment of personnel and equipment and the rapid implementation of reorganization measures will allow the unit to maintain momentum and continue the mission.
- Reducing risk. Commanders plan and conduct operations with the knowledge that WMD may be used by an adversary at any time. Reducing the risk of their use is achieved primarily by avoiding detection and retaining mobility.
- Operating offensively. Nullify the use of WMD by attacking them at their source, before they can be used against friendly forces and populations.

The growth of WMD has altered the nature of regional conflict and subsequently the objectives and outcomes. Furthermore, the introduction of forces into regional conflicts has become increasingly risky. So commanders must use an effective combination of offensive and defensive operations to deter or limit the use of WMD by an adversary.

The potential for the use of WMD requires planners to consider creating force dispositions that do not provide lucrative targets. In addition, operations must incorporate force protection imperatives to ensure force preservation throughout the duration of the conflict or operations other than war. Effective use of NBC recon, smoke, and decon assets will enhance force protection during every phase of an operation. Leaders must emphasize training to reduce the effects of the threat or actual use of WMD.

NBC THREAT

US forces face a potential NBC threat across a broad range of military operations. Many potential adversaries use former Soviet-style equipment and doctrine. Others use a mixture of military equipment and have developed their own doctrine. So we must study potential threat forces, their general military doctrine, and their concept for using WMD. By understanding potential adversaries' NBC capabilities, a picture of the modern NBC battlefield can be developed.

Regional Threat

The growth of NBC capabilities beyond those of major world powers has increased the likelihood of NBC use. The number of developing countries seeking the technology for nuclear weapons and advanced surface-to-surface missiles (SSM) has increased. Since 1985 more than 20 countries are reported to have chemical weapons. No developing nations' doctrine for the use of NBC weapons exists. It would be safe to assume that any doctrine used would be based on their sources of training, systems, and technological advances. More detailed information on this subject is available from other sources.

Nuclear Warfare

Thirty years after World War II, nuclear weapons were the sole prerogative of five world powers: the US, Soviet Union, Great Britain, France, and China. The detonation of a nuclear device in India in 1974 marked the first instance of another nation joining the nuclear fraternity. Today a variety of nations have or

desire the technical capabilities to develop a nuclear weapons program. Many nations are seeking access to the materials needed to produce nuclear weapons. Many nations known as aggressors to their neighboring countries are actively pursuing these capabilities.

Many of these nations have delivery means for nuclear munitions. The acquisition of nuclear capability would give them the political advantage they need to wage war at will.

Biological Warfare

Biological weapons have been characterized as the poor man's atomic bomb. Many BWs represent cheaper and less sophisticated alternatives to chemical, nuclear, and conventional weapons. According to the United Nation's testimony of a panel of chemical-biological warfare experts in 1969, the estimated cost per square kilometer of coverage (for BW weapons) needed to produce mass casualties was only one dollar. In contrast, the estimated costs for comparable coverage were \$600 for chemical nerve agent weapons, \$800 for nuclear weapons, and \$2,000 for conventional weapons.

Today, production of a fissionable device would cost hundreds of millions of dollars. Botulinum toxin can be produced for under \$400 a kilogram. In addition, BW agents can be produced with little difficulty in a relatively short time. They can be produced covertly by those of modest education using limited tools and space. In the 1980's, an increasing number of Middle Eastern countries turned their attention to the development of BW agents. Using commercially available equipment and established microbiological techniques (perfected decades ago), several countries rapidly put together viable offensive BW programs.

Vietnamese use of mycotoxins in Kampuchea in the 1970's and 1980's proved the effectiveness of toxins. Mounting evidence indicates forces on the battlefield are susceptible to the hazards of toxins and genetically engineered pathogens.

Chemical Warfare

Most countries do not have the technology or the resources to build nuclear weapons. However, many countries could produce chemical weapons. In the 1970's and 1980's, there was an increased emphasis on the development of chemical weapons in the Middle East. The actual use of chemical agents in warfare in the Iran-Iraq conflict soon followed. Chemical munitions require little more expense or expertise to manufacture than conventional munitions.

The technology and literature are readily available on the world market. Once the decision is made to arm with chemical weapons, stockpiles can be rapidly produced.

Since the end of World War II, combatants have used chemical weapons in Yemen (1963 to 1967), Laos and Cambodia (late 1970's), Afghanistan (mid-1980's), and the Iran-Iraq War (late 1980's). In some cases, notably against large concentrations of untrained troops, chemical weapons have been credited for major successes. World censure of chemical weapons has been sporadic and ineffective.

Initially, developing nations use of chemical weapons may be unsophisticated. The learning curve for use, even with military advisors, will be slowed by rudimentary training in basic skills. The combatants must learn to handle the logistics burden, friendly protection, weapons effects prediction, and difficulty in storage and handling. A potential aggressor facing US forces would probably prefer to use a massive first strike for maximum effect.

However, he may not have the logistics or fire support base to support such an attack. Even if he can support the strike, he may reveal his intentions through intelligence indicators. Further, the threat of massive conventional retaliation may disrupt the attacker's activities. We cannot predict whether or not a developing nation would use chemical agents against well-trained and well-equipped forces who have a devastating array of retaliatory options. From our perspective, a decision to use chemical weapons against US forces may seem ill-advised. However, politico-military decisions of this nature rarely follow Western logic,

Operational Use

Developing nations' adversaries who follow former Soviet doctrine, with adequate stocks of chemicals, will likely use persistent chemical agents to restrict air base and port operations. Persistent nerve and blister agents will slow or stop the servicing of aircraft and ships and hinder cargo handling. Persistent agents on logistics facilities will impair resupply and service operations. It will seriously delay medical care and the use of pre-positioned stocks.

Tactical Use

Developing nations' combatants who use former Soviet doctrine, with adequate chemical stocks, would likely use nonpersistent agents against front line troops and on lines of attack. They would be

inclined to use persistent agents on bypassed troops, strongpoints, and flanks. They may use persistent or nonpersistent chemicals in barrier and denial plans. With small stockpiles, however, they may use chemicals selectively to support a critical attack or defense, particularly against massed troops or potential staging areas. Some of these nations place a different value on human life than we do. The use of non-persistent chemicals against an unprotected populace would impact US and allied forces, both politically and militarily. Competition for scarce medical resources and increased refugee flow on main supply routes (MSRs) are just a few of the difficulties planners must consider.

The possibility of use of chemical weapons by terrorist groups must not be overlooked. US forces must prepare for any adversarial use of chemicals. Any country with a chemical or pharmaceutical industry can produce chemical agents. Nation-states inclined to weaponize these substances may hide their production behind the guise of pharmaceutical or industrial chemical facilities.

Iraq

In over eight years of military operations against Iran, Iraq built a competent military force committed to large-scale combined arms operations that include the integration of chemical weapons. Iraq's success radically changed the style of warfare in the Middle East. They are doctrinally attuned and tactically capable of using chemical weapons by all means to include artillery, rockets, helicopter fire aerial bombs, and possibly by tactical ballistic missiles.

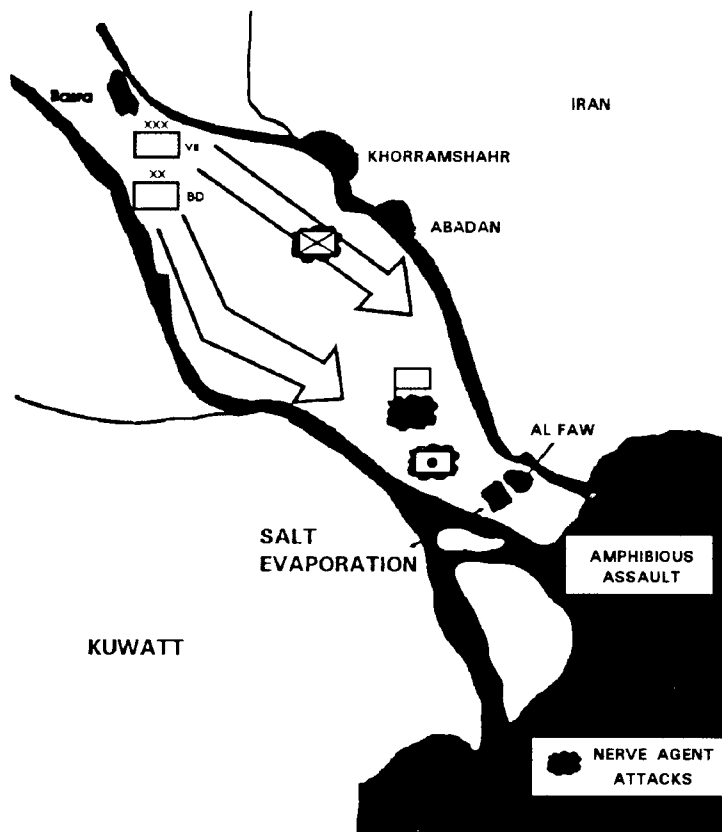
To avoid defeat, Iraq sought out every possible weapon. This included developing a self-sustaining capability to produce militarily significant quantities of chemical warfare agents. In the defense, integrating chemical weapons offered a solution to the masses of lightly armed Basif and Posdoran. Chemical weapons were singularly effective when used on troop assembly areas and supporting artillery. When conducting offensive operations, Iraq routinely supported the attacks with deep fires and integrated chemical fires on forward defenses, command posts, artillery positions, and logistical facilities.

US NBC RESPONSES

The overriding mission of US armed forces is to deter war. Should deterrence fail, the US will prosecute war to a successful conclusion. Should the enemy use NBC weapons, US armed forces will respond with military operations, which may include nuclear and

HISTORICAL VIGNETTE

"In April 1988, Iraq began Operation 'Blessed Ramadan' to retake the Al Faw peninsula. The attack began on the morning of 17 April. Armored forces of the Republican Guard conducted the main attack. The Iraq 7th Corps conducted a supporting attack along the west bank of the Shatt al-Arab waterway. The Iraqis also conducted two amphibious assaults along the western coast of the peninsula. The Iraqi plan called for a three-phases operation lasting four to five days. The employment of chemical weapons was an integral part of the Iraqi plan. Nonpersistent nerve agent was used on the defending Iranians. Reports indicated that front line forces, command and control sites, and artillery positions were targeted."



"Both artillery and aircraft delivered the chemical agent on the intended targets. Only 35 hours were required to complete the operation. The Iranians never recovered from the initial assault and were unable to reestablish an effective defense. The Iranian retreat across the Shatt al-Arab waterway turned into a complete rout, with the Iranians abandoning most of their equipment. The Iraqis did not win this battle solely by employing chemical weapons, but their impact was significant. The employment of chemical weapons in this battle caused casualties, disrupted operations, hindered battle command, and allowed the Iraqis to retain the initiative throughout the attack.

Lessons from the Iraq-Iran War show that the employment of chemical weapons did have tactical significance during several battles. One analyst felt that the employment in the Iran-Iraq War was an example of "low-level, sporadic use of chemical weapons." He concluded that "this was far less devastating to those involved than it might have been or could be in a future conflict." Yet, this limited usage was a major contributor to Iraq's successes against an otherwise superior force. The Iraqi use of chemical weapons during its war with Iran clearly demonstrates the impact that weapons of mass destruction can have on the battlefield."

Figure 1-2. Battle for Al Faw, April 1988.

conventional attacks. The goal of these operations is to force the enemy to cease NBC warfare. See Figure 1-3 for US employment policy during armed conflict.

US national security policy is to seek a reliable, verifiable ban on the production, stockpiling, and use of NBC weapons. Without such a ban, the US deters adversaries development or use of NBC weapons through a balance of information activities, political, economic, and military measures. International cooperation through processes such as bilateral and multilateral treaty negotiations and public education helps limit an adversary's willingness to produce and use NBC weapons. These efforts are also aimed toward destruction of chemical warfare (CW) stocks.

US military policy is to deter enemy NBC use through a strong nuclear force and an NBC defense posture that enables US forces to survive, fight, and win under NBC conditions. The US seeks to control NBC weapons through treaties and counter-proliferation initiatives.

The US may use nuclear weapons to terminate a conflict or war at the lowest acceptable level of hostilities. This means we may use nuclear weapons first. Another nation(s) cannot attack us using conventional weapons without risking nuclear war. When faced with a numerically superior enemy, we reserve the right to use nuclear weapons against that enemy. Nuclear weapons use requires Presidential release authority.

The US will never use biological agents. Enemy use of biological agents or toxins against US or allied forces will be considered a violation of the 1972 Biological Weapon Convention and possibly the 1925

Geneva Protocol. US policy allows the option of responding to such an attack with conventional or nuclear weapons.

The US will not use chemical weapons. We will try to deter enemy use or cease enemy use of chemical weapons by conventional and other means.

The US considers neither herbicides nor riot control agents chemical weapons. But, we have adopted policies concerning their possible use during armed conflict.

The US has renounced first use of herbicides in war except for control of vegetation within US bases and installations or around their immediate perimeters. The President must approve the use of herbicides in war.

The US has renounced first use of riot control agents (RCAs) in war except in defensive military modes to save lives, such as in—

- Riot control situations in areas under direct and distinct US military control, including the control of rioting prisoners of war.
- Situations in which civilians are used to mask or screen attacks and civilian casualties can be reduced or avoided.
- Rescue missions in remote or isolated areas, such as recovering downed aircrews and passengers and rescuing escaping prisoners of war.
- Rear-echelon areas outside the zone of immediate combat to protect convoys from civil disturbances, terrorists, and paramilitary operations.
- Security operations regarding the protection or recovery of nuclear weapons.

The President must approve the use of RCAs in war. Chapter 5 contains more information on the use of herbicides and RCAs.

Throughout history new weapons have been used primarily against troops who have limited defensive or retaliatory capability. Chemical (gas) weapons were first used on a large scale by Germany in World War I against Russia, France, and Britain. Germany maintained a technological lead in chemical warfare throughout World War I. This lead allowed German forces to introduce chemicals and delivery systems that sometimes proved very effective.

Nations have shown little restraint in their weapons selection when opposing an enemy that could not defend itself against certain weapons or retaliate in kind. The Italo-Abyssinian War of 1935 is one example. Major General J.F.C. Fuller, military historian, reported, "It is no exaggeration to say the mustard gas sprinkled from airplanes (by the Italians)

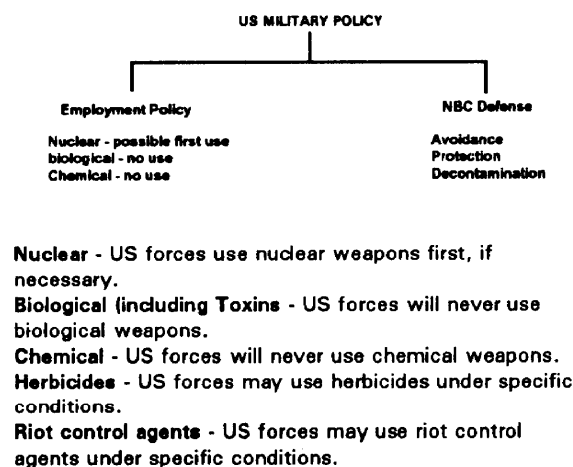


Figure 1-3. US employment policy during armed conflict.

was the decisive tactical factor in this war, because it shortened its duration by months, if not by years. ”

Potential adversaries will use NBC warfare to counter—

- **Initiative.** Contamination degrades the ability of commanders and their subordinate leaders to set or change the terms of battle.
- **Agility.** NBC contamination and protective measures have a degrading effect on the mental and physical quality of friendly agility. This reduces the ability of commanders and their subordinate leaders to rapidly concentrate friendly strength against enemy vulnerabilities.
- **Depth.** Combat actions frequently require more personnel under NBC conditions. This additional concentration of forces in close operations reduces the commander’s ability to control the necessary space through the depth of the battlefield and to maneuver effectively.
- **Synchronization.** NBC weapons attack command, control, and communications, and degrade the commander’s ability to arrange battlefield activities to produce maximum relative combat power at the decisive point.
- **Versatility.** The residual effect of NBC contamination strips away a unit’s versatility. Contaminated units are unable to shift rapidly from one mission to another.

US forces will survive and win under NBC conditions by using established doctrinal principles. By being better prepared than the enemy for continuous operations under NBC conditions, we will maintain an advantage. This advantage will deter aggressor use of NBC weapons. If an enemy uses these weapons, our advantage will force him to cease use or continue the conflict at a disadvantage. US forces use three basic NBC defensive principles:

- **Avoidance.** This principle forms the cornerstone of our defensive doctrine. If we can avoid NBC effects through active or passive defensive measures, we reduce our casualties. We avoid the burdens of protection and decon, eliminating significant time and resource requirements. Avoidance measures include

camouflage and concealment, dispersion, recon, detection, warning, and limitation of contamination spread.

- **Protection.** If we must operate in a contaminated area, we must protect ourselves and our equipment. In this way we can avoid losing combat effectiveness. Protection involves hardening of positions, application of MOPP, and individual and unit actions before, during, and after such an attack. Protection also includes the use of collective protection for our fighting systems.
- **Decontamination.** If we become contaminated, we must decontaminate to allow a reduction in protective posture. Reducing our protective posture increases our combat power. Decon enhances survivability on the contaminated battlefield.

Chemical units support the force’s use of NBC defense principles. Their presence is a factor in the maintenance of deterrence (for example, strong NBC defense capability). Chemical units operate throughout the theater, from the communications **zone to the** combat zone. The important combat support role provided by chemical units supports the force with smoke, NBC recon, and decon operations.

Support responsiveness brings about increases in combat power by providing needed obscuration and NBC defense support. Chemical battle staff is integrated into US Army force structure from company to Army service component command (ASCC) level. These soldiers provide essential staff support and advise commanders on implementation of NBC defense principles. Chapters 4 and 7 contain more information on the principles of NBC defense and chemical unit organization, respectively.

NBC response directly implements US national security policy. All military operations pursue and are governed by political objectives. Success in battle must translate to a desired political outcome. This manual does not address the formulation of US strategies of warfighting. It provides chemical leaders and staff officers with doctrinal guidance on how to fight and win under NBC conditions.

Chapter 2

NBC Operations and the Fundamentals of Army Operations

"The Secretary of War's Annual Report for 1917 ... declared that the 'councils of prudence and forethought' should prepare the Army to surprise the enemy rather than lag 'defensively behind the surprises which he prepares for us.'"

**--U.S. War Department
Annual Report 1917**

FM 100-5, Operations, is the capstone doctrine describing how the Army fights. It forms the basis for Chemical Corps doctrine contained in this manual. This chapter covers the basics of operational doctrine specifically as it applies to NBC and smoke operations.

ELEMENTS OF COMBAT POWER

Army operations recognizes the dynamics of combat power and its elements: maneuver, firepower, protection, and leadership. The skillful combination of these four elements at the right time and place will defeat the enemy.

Effective maneuver is the first element of combat power. Commanders maneuver their forces into positions of advantage over the enemy. The NBC defense system will minimize the effect of NBC conditions on the force and allow commanders to operate at high levels of effectiveness. However, NBC contamination may decrease operational tempo by requiring additional force protection measures. Commanders maneuver their units under NBC conditions, minimizing degradation of soldiers by using all available information to avoid contamination, and using NBC protection measures when required.

Chemical units provide NBC recon, decon, and generated smoke support. Chemical smoke conceals movement of friendly forces and hinders enemy freedom of maneuver and synchronization. Maneuver is also helped by contamination avoidance and control.

The second element is firepower. Commanders mass fires on the battlefield by rapidly positioning weapon systems for concentrated fires on lucrative enemy targets. The integration of smoke and obscurants disrupts and disorganizes enemy forces. Smoke delivered by various means conceals our maneuver and degrades enemy reconnaissance, intelligence, surveillance and target acquisitions (RISTA). Flame operations are also contributors to combat power when used for countermobility or psychological operations.

Protection, the third element of combat power, includes NBC contamination avoidance and control,

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NBC protection, and decon operations. The protection aspect of NBC defense permits maximum mission performance with minimum casualties. Units protect themselves by avoiding contamination whenever possible. Contamination spread is limited so it presents the minimum possible hazard to personnel. It has the minimum impact on operations; and it allows the rapid resumption of routine operations.

Decon operations may permit reduction in NBC protection levels, thereby increasing combat power potential. Obscurants enhance protection by increasing force survivability, lessening the chance of enemy detection.

The final element is leadership. Competent leaders at all levels ensure chemical units are fully integrated into the combined arms team. Chemical units give maneuver commanders the ability to see the battlefield better through timely NBC recon or by minimizing their risks through obscuration. Timely NBC advice helps maneuver commanders make critical choices within the enemy's decision cycle.

Chemical leaders ensure their soldiers are well motivated, trained, and disciplined to withstand the stress of the modern battlefield and serve as members of the combined arms team.

PRINCIPLES OF WAR

The principles of war serve as a guide for our forces. The principles have withstood the tests of time, analysis, and practice. The principles of war include—

- Objective
- Offensive.
- Mass.
- Economy of force.
- Maneuver.
- Unity of command.
- Security.
- Surprise.
- Simplicity.

Decisive and attainable objectives are central to any military operation. Leaders continue to recognize the criticality of clearly defined objectives even as battlefield conditions change with enemy use of WMD. Leaders and staff improve their understanding of assigned missions by wargaming different courses of action. Alternative scenarios, including NBC conditions, are integrated into wargaming to ensure crucial contingencies are considered.

The principle of the offensive directly relates to attaining a common objective. Leaders use initiative and apply the principle of NBC contamination avoidance to maintain freedom of action and achieve required results. In the spirit of the offensive, leaders minimize the time their soldiers spend in full MOPP. Leaders make intelligent decisions that effectively balance mission accomplishment against expected threat.

Combined arms task forces mass combat power at the decisive time and place. Effective and timely use of hasty and deliberate smoke, NBC recon, and decon are all combat multipliers. Obscuring the massing of our forces, determining when and where to avoid contamination, and decontaminating to retain flexibility of action support leader efforts to maintain the initiative.

Leaders apply economy of force in using minimum essential combat power for secondary efforts. Commanders use deception, supported by hasty and deliberate smoke, to achieve superiority at key places. NBC contamination avoidance passive measures (for example, cover, concealment, dispersion) also support economy of force. Leaders consider all available lethal (flame) and nonlethal measures (smoke) to gain advantage against an enemy.

Our maneuver is designed to place an enemy in a position of disadvantage. We use organic and attached NBC recon assets to find clean and contaminated areas. Leaders use this information to exploit success and maintain freedom of action. Smoke masks our movement, blinds and deceives the enemy.

In unity of command, task force commanders use all assigned and attached assets. Chemical combat support elements respond to the commander's intent. The chemical unit leader prepares a plan that fully supports the mission. Leaders make maximum use of all attached units, and subordinates ensure that the intent is fulfilled through continuous application of all combat power.

Security is similar to the force protection component of combat power. Units battle-focus training ensuring needed protective measures are integrated. Units know they are proficient in operations under NBC conditions. Leaders, (officers and NCOs) set the example and the standard in proficiency on individual soldier survival tasks (for example, use and maintenance of MOPP gear). Thorough preparation of units and leaders helps to ensure the preservation of needed strength for critical times.

We surprise the enemy and strike at a time, place, or manner, for which he is unprepared. We use smoke and obscurants to confuse and deny the enemy information and contribute to surprise. The enemy reacts slowly because our forces are concealed under limited visibility conditions. This allows us to strike quickly to affect decisively the outcome of battle. We may also surprise an enemy with unexpected use of flame on the battlefield.

Simplicity provides clear and concise plans and orders to ensure rapid and thorough understanding. Leaders and soldiers understand Army NBC defense doctrine of avoidance, protection, and decon. Leaders ensure clarity in plans and orders. Units conduct mission-essential training under simulated NBC conditions. This supports stripping away any illusions in operations under true NBC conditions. It supports a direct approach to the battlefield environment. This approach will reduce the chances for misunderstanding and confusion and support the principle of simplicity.

TENETS OF ARMY OPERATIONS

The Army develops combat power by fighting according to the five tenets of Army operations: initiative, agility, depth, synchronization, and versatility.

Initiative — setting or changing the terms of battle by actions. It implies an offensive spirit in the conduct of all operations, regardless of the nature of the operation. Applied to individual soldiers and leaders, it requires a willingness and ability to act independently within the framework of the higher commander's intent. Leaders are adept at determining their NBC defense needs and taking timely, critical actions. Operations under NBC conditions cause individual and unit degradation. Leaders anticipate mission requirements and set appropriate protection levels. Effective use of NBC defense, smoke, and flame enables task forces to steal the initiative from the enemy or to keep him off balance. Leaders seek to exploit any advantages offered by NBC conditions.

Agility — ability of friendly forces to act faster than the enemy. It is the prerequisite for seizing and holding the initiative. Units (and leaders) must be physically and psychologically capable of responding to rapidly changing requirements. Chemical units are task-organized to ensure rapid response to changing situations. They shift support to the main effort with

minimal delay through reconfiguration and coordination. They are sustainable and responsive to maneuver commanders at all echelons. Effective battlefield reporting supports rapid responses to attacks. Flexibility and decentralization of MOPP decisions support timely reaction to enemy threats. Tailored force packages increase combat power.

Depth — extension of operations in space, time, and resources. Chemical personnel and units provide support throughout the theater of operations. To maintain momentum on a contaminated battlefield, units avoid contamination using organic NBC recon capability or they decontaminate to decrease MOPP for sustainment of combat operations. Elasticity in the defense is achieved by using additional combat multipliers, such as hasty or deliberate smoke, throughout the depth of the battlefield.

Synchronization — management of battlefield activities in time, space, and purpose to produce maximum relative combat power at the decisive point. Commanders synchronize activities. They thereby produce synchronized operations. Commanders integrate NBC recon, obscurants, and decon support to reap the desired benefit at the desired time and place and in the desired manner. ~~Commanders~~ ensure that the multiple chemical activities spread across the battlefields have unity of purpose with the rest of the force.

Versatility — ability of units to meet diverse mission requirements. The ability to execute other than war missions while retaining the capability to execute wartime missions is critical. Chemical units and staffs will find themselves involved in a wide range of missions across the range of military operations. During combat operations chemical staffs and units must be prepared to rapidly change focus and move from one area to another to execute their missions.

THE RANGE OF MILITARY OPERATIONS

The theater strategic environment consists of a variety of conditions — political, economic, military — and a range of threats that result in a wide range of operations that correspondingly occur in response to those conditions and threats. The Army operates in three diverse states: peacetime, conflict, and war. Army activities during peacetime and conflict are classified as operations other than war (OOTW). The last state — war — involves the use of force in combat operations against an armed enemy.

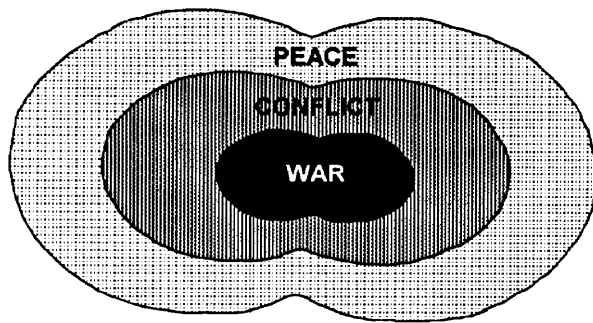


Figure 2-1.

Peacetime

Peacetime is a state wherein political, economic, informational, and military measures, short of combat operations or active support to warring parties, are used to achieve national objectives. Within this state, US forces may conduct joint training exercises to demonstrate resolve, conduct peacekeeping operations, participate in nation-building activities, conduct disaster relief and humanitarian assistance, provide security assistance to friends and allies, or execute shows of force.

Conflict

Conflict is an armed struggle or clash between organized parties within a nation or between nations in order to achieve limited political or military objectives. While regular forces are often involved, irregular forces frequently predominate. Conflict is often protracted, confined to a restricted geographic area, and contained in weaponry and level of violence. Within this state, military power (in response to threats) may be exercised indirectly while supporting other elements of national power. Within this state US forces may conduct attacks and raids, participate in peacekeeping operations, execute counternarcotics operations, or support foreign internal defense activities. Limited objectives may be achieved by the short, focused, and direct application of force.

Conflict also describes situations where continuing clashes or crises occur over boundary disputes and water territorial claims. Conflict also describes situations in which opposing political factions engage in military actions to gain control of political leadership within a nation. In the future, potential exists for crises and clashes in space. As the amount of forces, frequency of battles, number of nations,

levels of violence are increased and sustained over an extended period, or when the sovereignty of a nation is threatened, conflict approaches the threshold of a state of war.

In low-intensity conditions, the use of CB weapons will be primarily oriented towards achieving political or psychological objectives. The primary threat will be a single attack, or a small number of attacks, for the following purposes—

- **Recognition.** Terrorist groups may use CB weapons for shock effect to gain national or international recognition of a cause. The use of NBC weapons will attract a strong amount of media attention.
- **Coercion.** Terrorist groups may use selective, small-scale CB attacks or the threat of NBC attacks to obtain revision of a government policy through fear.
- **Provocation.** Government, military, or police activities may be attacked with CB weapons to provoke heavy-handed reaction on the part of government forces.
- **Intimidation.** The threat or use of CB weapons may prevent individuals or groups from acting against terrorist or insurgency groups. Security forces may be afraid to act if they fear reprisal with CB weapons.
- **Insurgency support.** The use or threat of CB weapons use may cause a government to overextend by trying to protect both its urban and rural areas. This may facilitate insurgency operations against thinly-spread military and police forces.

A wide variation exists in the types of weaponry used in low-intensity conflict (LIC). Modern weapons may be obtained from other nations. Chemical and biological weapons may be fabricated by the attackers. Existing industrial facilities may be sabotaged to create a hazard or discredit a friendly government.

Chemical units and NBC production and storage facilities must be protected against attack by terrorists and insurgents.

Terrorists may attack civilian populations and/or host country forces. US security assistance forces may give assistance by intelligence, warning, provision of NBC protective equipment, and decon. Terrorist or insurgent groups (unidentified) could also use CB weapons to create fear and unrest.

War

War is sustained armed conflict between nations or organized groups within a nation. Regular and irregular forces are involved in a series of connected battles and campaigns to achieve vital national

objectives. War may be limited by self-imposed restraints on resources or objectives. It may also be general having the total resources of a nation or nations used and national survival at stake. War can also range from high- to low-intensity in nature. Within these states US forces may conduct conventional war or execute strategic offensive operations.

Conditions in conflict or war may cause US forces to face large, rapidly maneuvering battlefield formations equipped with sophisticated weapons, operating over extended time and distance.

Advanced weapons systems technology provides the capacity to acquire, track, classify, and attack targets at ranges unattainable in previous conflicts. Communications and artificial intelligence systems enhance the ability of command and control elements to maneuver large forces rapidly.

NBC weapons added to an already large array of highly lethal weapons challenge us to protect the force, maintain freedom of maneuver, and sustain operations.

In mid- to high-intensity conditions NBC weapons are used primarily to achieve the maximum military effect. Enemy goals for use of NBC weapons in mid- to high-intensity warfare may be to...

- Cause the collapse of morale and paralysis of will.
- Cause tactical problems and create mass casualties.
- Degrade battle command and logistical operations.

NBC warfare may be initiated at the onset of hostilities to increase shock effect and achieve rapid breakthrough and demoralization of defending forces. NBC warfare may not be used initially, but if defending forces are successful in slowing or stopping an attack, a combatant may resort to an NBC attack to help regain the initiative and restore the momentum of the attack. If defending forces counterattack and threaten the attacker's operational and strategic objectives, the attacker may use NBC weapons to halt the defender's progress and regain the offensive.

The weaponry used will vary, depending on the adversary and the circumstances surrounding the conflict. Enemies may use World War I vintage agents, such as mustard. They may use ultra-lethal chemical agents, genetically-engineered biological agents, toxins, or nuclear weapons. They can deliver these weapons by mortars, artillery, surface-to-surface missiles, aircraft, special operations forces, vectors, clandestine operations, or sapper/saboteur emplacement.

CLOSE, DEEP, AND REAR OPERATIONS

The outcome of battles, major operations, and campaigns depends ultimately on the success in synchronizing deep, close, and rear operations. Chemical staffs and units participate at all echelons in the planning and coordination process to ensure these operations support the overall battle.

Close operations at any echelon comprise the current activities of major committed combat elements, and their immediate combat support (CS) and combat service support (CSS). As part of close operations, chemical units operate either integrated into a committed unit or in support of it.

Deep operations at any echelon comprise activities directed against enemy forces not in contact, but designed to influence the conditions in which future close operations will be conducted. Deep operations often include assets other than ground maneuver forces. In this case the chemical staff provides input for fire support operations to the commander.

Integrating smoke, obscurant, and conventional fires to support deep operations reduces the enemy's operational tempo, disrupts his battlefield synchronization, and upsets his timetables. The synergistic effect of combined smoke and conventional weapons use disrupts the enemy's battle plan and slows enemy actions.

Whenever ground forces conduct deep operations, NBC recon assets monitor routes necessary to support the action. The NBC recon platoon can conduct NBC recon for deep operations. However, the NBC recon element should be augmented either by a scout team or combat team to provide security. Security is essential to ensure survivability in deep operations.

Rear operations comprise activities rearward of elements in contact. Rear operations are designed to assure freedom of maneuver and continuity of operations, including continuity of sustainment and command and control. All of these operations require protection. NBC protection of fixed sites and mission-essential personnel (US and host nation) is a significant requirement for ensuring sustained operations. NBC-hardened protective shelters ensure critical battle command functions are unimpeded by NBC attacks. Chemical units support protection of rear-area facilities by providing smoke and decon support. Additionally, NBC recon support provides important intelligence information on the presence or absence of contamination.

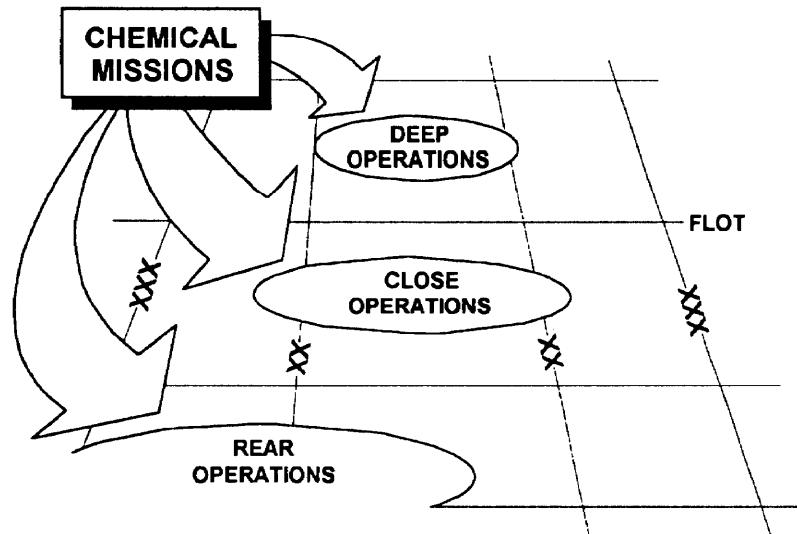


Figure 2-2.

PSYCHOLOGICAL OPERATIONS

Psychological operations (PSYOP) are a vital part of modern military and political power. When fully coordinated with tactical/operational/strategic military planning and effectively integrated into the military decision-making process, PSYOP enhance combat power. Psychological operations are defined as planned operations to convey selected information and indicators to foreign audiences. Such operations are designed to influence emotions, motives, objective reasoning, and ultimately the behavior of foreign governments, organizations, groups, and individuals. The purpose of PSYOP is to induce or reinforce foreign attitudes and behavior favorable to the originator's objective. In NBC warfare, psychological impact on the enemy can be obtained by emphasis on US defense capability and threat of retaliation as deterrents, as well as by weapons. Such effects can be supplemented and enhanced by PSYOP. So, PSYOP is a combat multiplier. For implementation of PSYOP under NBC conditions, refer to FM 33-1.

CHEMICAL CORPS MISSIONS

The mission of the Chemical Corps is to protect the force and allow the Army to fight and win under NBC conditions. The Corps does this by developing doctrine, equipment, and training for NBC defense, which serve as a deterrent to any enemy possessing

weapons of mass destruction. The Chemical Corps also provides the Army with the combat multipliers of smoke, obscurant, and flame capabilities.

The nature of war on today's battlefield poses great challenges. High- and mid-intensity battlefields will be chaotic, intense, and highly destructive. Low-intensity conflicts may pit US forces against irregular or unconventional forces, enemy special operations forces, or terrorists anywhere in the world. Any of these conflicts may lead to biological warfare and/or chemical warfare. It could escalate into nuclear warfare.

Chemical staffs and units work to restore, maintain, and/or increase combat power on this battlefield.

Chemical Corps missions include —

- Battle management.
- NBC Defense.
- Nonlethal operations.
- Smoke and obscurants.
- Flame.

Historically, the US Army Chemical Corps fought successfully in past wars and performed its battlefield functions. Army operations doctrine now places even greater demands upon the Chemical Corps to support military operations.

Battle Management

Battle management is the integration of battlefield assessment and risk analysis with NBC warning and reporting, chemical unit operations, and nuclear operations. The chemical advisor manages NBC operational elements to support the commander's concept of operations. He assists the intelligence

section in evaluating friendly and enemy vulnerabilities. He manages the NBC warning and reporting system to develop a picture of battlefield hazards. He recommends use of chemical units. He assists in the preparation of nuclear fire plans to support the battle. He assists in potential collateral damage prediction/assessment from NBC weapons use. Chapter 3 describes battle management.

NBC Defense

NBC defense includes all measures to minimize casualties and enhance unit effectiveness under NBC conditions. These measures may be proactive or reactive in nature. They include contamination avoidance and control, protection, and decon. A sound program of NBC defense forms a key part of the US deterrent posture. Chapter 4 discusses the principles of NBC defense.

Nonlethal Operations

The use of riot control agents and other nonlethal materials provides combat commanders an alternative to the use of lethal force. This alternative is very attractive in OOTW, where the use of lethal force is neither desirable nor acceptable. The use of riot control agents is specified by Executive Order 11850 and the Joint Strategic Capabilities Plans (JSCP). Chemical staffs and units provide both technical and tactical expertise on the use of riot control agents, herbicides, and other nonlethal materials. Chapter 5 describes the use of riot control agents and herbicides.

Smoke and Obscurants

Smoke and obscurants are combat multipliers. They deny the enemy critical data, interfere with enemy weapon systems, and deceive the enemy about friendly intentions and activities. Man-made smoke combines with natural obscurants to defeat or degrade visual and thermal signals. Chapter 5 describes smoke and obscurant use and countermeasures.

Flame

Flame is a point and area effects weapon with physical and psychological impact. Its damage continues and compounds after the initial burst. Forces on the battlefield use flame weapons and flame field expedient devices in offensive and defensive operations as well as military operations on urban terrain (MOUT). Chapter 5 also discusses flame use and defense.

COMBAT FUNCTIONS

The commander uses a variety of combat functions to build and sustain combat power. He must integrate and coordinate these functions to achieve the desired battlefield effects. Chemical missions must be integrated into each combat function for successful execution of combined-arms operations. The combat functions are...

- Intelligence.
- Maneuver.
- Fire support.
- Mobility and survivability.

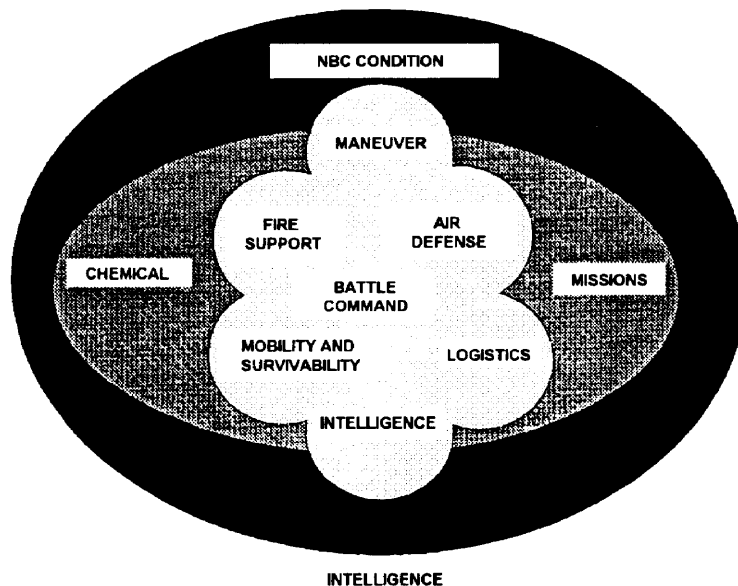


Figure 2-3

- Air defense.
- Logistics.
- Battle command.

Combat functions are tools to describe functions on the battlefield. These operating systems should not be confused with Army branches or proponents. Despite the familiar branch-oriented terminology of these seven functions, each includes activities performed by many segments of the force. The various activities within the force are responsible for performing functions in several or all of the functions in the execution of assigned missions.

Intelligence

Intelligence collection and the intelligence and electronic warfare (IEW) effort require agile and flexible systems and units. These systems and units locate and attack the threat in support of close, deep, and rear operations.

The intelligence combat function includes functions that generate knowledge of the enemy, weather, and terrain. The commander uses this knowledge in planning and conducting combat operations. The intelligence officer, in coordination with the chemical staff officer, develops priority intelligence requirements (PIRs) and information requirements (IRs) needed to collect information on enemy NBC, obscurant, and flame capabilities and intent.

During battle management activities the chemical staff advisor works with the G2 or S2 on the intelligence preparation of the battlefield (IPB). Potential targets the enemy may attack with WMD are identified in the area of operations. The chemical staff coordinates with the intelligence officer to analyze and identify enemy chemical targets based on threat, terrain, and area of operations. Potential threat chemical targets could be key terrain, chokepoints, command and control facilities, counterattack routes, mobility corridors, and rear area. The general situation statement that the enemy will use persistent chemical agents on the flanks and nonpersistent chemical agents in forward areas does not provide the commander with a good understanding of the chemical threat.

Another battle management tool is the NBC warning and reporting system. This system helps develop a comprehensive picture of enemy NBC use.

NBC defensive procedures may also yield information for the intelligence combat function. Units conduct NBC recon to identify required unit actions or posture. This recon also collects data

needed to assess enemy use. Recon units detect, identify and mark NBC contamination. They collect samples of suspected NBC agents. They gather meteorological and terrain data. This information feeds into the intelligence system. The chemical staff and the G2 or S2 use this information to predict enemy intentions.

Maneuver

The maneuver combat function is the use of forces on the battlefield. Maneuver is accomplished through movement and direct fires in combination with fire support or fire potential. Maneuver enables friendly ground forces to gain a tactical advantage over enemy ground forces. Maneuver elements of a force operate with the intention of moving into positions where they can bring their direct and indirect fires to bear on the enemy with the greatest effectiveness.

Friendly forces may have to move, engage the enemy, or control terrain under NBC conditions. The chemical staff advisor uses battle management techniques to develop a picture of NBC hazards on the battlefield. He analyzes friendly vulnerability to enemy NBC weapons. The maneuver commander takes proactive and reactive measures to reduce vulnerability to these weapons. He implements contamination avoidance and control. He applies appropriate protection to maintain maximum combat power against the enemy with acceptable risk. Should his unit become contaminated, he will restore combat power and reduce further casualties by decon.

The commander uses obscurants to enhance survivability during movement. Obscurants can improve relative combat power during engagements by diverting enemy resources or degrading enemy weapon systems. Obscurants support the occupation of fighting and support positions by denying enemy intelligence. Obscurant countermeasures support movement and direct fire engagements by providing friendly intelligence and fire control measures.

Flame and incendiary weapons are also used against selected targets to engage enemy forces. Flame weapons (for example, flame field expedients) can be used to restrict terrain to the enemy by controlling its use through direct fire or fire potential.

In the direct fire battle under NBC conditions, commanders must consider the following factors:

- Attacks will take longer.
- Firing rates decline.
- More soldiers are required for a successful attack.
- Units experience more difficulty in locating and identifying targets.

- Units are less effective in using terrain for cover and concealment.

Fire Support

The fire support function is the collective and coordinated use of target acquisition data, indirect-fire weapons, armed aircraft (fixed- and rotary-wing), and other lethal or nonlethal means against ground targets in support of maneuver force operations. The fire support plan is integrated into the scheme of maneuver consistent with the commander's intent. To achieve integration, the commander and his staff, with the advice and expertise of the unit fire support coordinator (FSCOORD), must think in terms of the total systems available to include nuclear munitions.

The commander allocates fire support systems to support his maneuver elements and preserve freedom of maneuver. The FSCOORD recommends the allocation of systems and organizations according to METT-T. When authorized, friendly forces may use nuclear weapons to cause casualties, restrict terrain, or reduce enemy effectiveness.

NBC defense supports the fire support combat function by enhancing the survivability of fire support elements. Contamination avoidance measures, such as detection and NBC recon, reduce the likelihood of exposure to NBC hazards. Appropriate levels of protective posture reduce the impact of attack. Rapid decon restores unit effectiveness.

The commander also uses artillery- or mortar-delivered smoke to mark targets and counter enemy target acquisition systems. Large-area smoke enhances survivability by concealing firing positions. Smoke also conceals the visual signature of firing and counters enemy flash and sound ranging procedures. However, smoke does not counter threat weapons-locating radar.

Studies show that units rely more heavily on indirect fire support under NBC conditions. In these conditions an attack takes longer. Personnel conducting the attack perceive that their direct fire is less effective. They call for fire more often. Further, the degradation of speech and hearing in MOPP results in longer times to complete calls for fire. Increased fire support response times still result when personnel remain in MOPP3/4 even when digital communications from observer to fire direction center to guns is used. As a result the fire support, combat function takes on added importance for combat operations under NBC conditions.

Mobility and Survivability

Mobility and survivability operations preserve freedom of maneuver of friendly forces. This operating system also includes measures taken to remain viable and functional by protection from the effects of enemy weapon systems and natural occurrences. This combat function also includes functions to enhance the effectiveness of friendly weapon systems by channeling the enemy, stopping or slowing his movement.

Battle management and NBC defensive principles are key to supporting the mobility and survivability combat functions. Leaders implement contamination avoidance measures to reduce casualties and to avoid burdensome protective posture. Units use protective measures such as deception, OPSEC, and dispersion to reduce the likelihood of enemy NBC attack. They use MOPP, NBC defensive equipment, and collective protection equipment (CPE) to avoid or reduce casualties. NBC recon enhances friendly force mobility by identifying hazards. Recon elements detect, identify, and mark NBC obstacles. They use the warning and reporting system to notify friendly units of NBC hazards. When notified, friendly units take appropriate protective measures to reduce risk. If they become contaminated, they conduct immediate decon of skin and personal equipment. This is followed by further decon as required to accomplish the mission.

Units conducting countermobility operations emplace obstacles to canalize, slow, or stop the enemy. These obstacles could include flame weapons and flame field expedient devices. In some cases the obstacle may be further contaminated with persistent chemical agent to increase breaching difficulties. Similarly, chemical fires on units conducting breaching operations force them into a burdensome protective posture. Following the breach these units must decontaminate or fight while contaminate. Throughout these actions friendly forces use smoke and other obscurants to deceive the enemy or conceal friendly operations.

Air Defense

Air defense as a combat function includes all measures designed to prevent or reduce the effect of attack or recon by hostile aircraft, missiles, or unmanned aerial vehicles (UAVs) — on the ground or in the air. An artillery strike on an enemy air base is a function of air defense operations.

The chemical staff advisor uses battle management to provide an overall picture of NBC hazards on the

battlefield. He also determines the vulnerability of friendly units. These factors aid the commander in positioning his air defense units. NBC defensive procedures enhance survivability and effectiveness of these units.

Smoke curtains used 2 to 3 kilometers from friendly positions can complicate targeting. Aircraft at speeds of 500 knots or greater need a minimum of 4 kilometers of unobstructed line of sight to acquire the target. Smoke curtains used with natural obstacles prevent aircraft from vectoring targets with on-board weapon guidance systems. Air defense systems requiring visual acquisition (Vulcan/Stinger) are located, at minimum, 2 kilometers from the smoke screen or on the high ground overlooking the smoke screen. Smoke screens can silhouette low-flying helicopters/aircraft for visual acquisition.

Commanders also use smoke and obscurants in valleys and nap-of-earth approaches to restrict enemy use of airspace. In some cases air defense units use flame weapons and devices to defend their positions.

Logistics

Logistics provides support and assistance to sustain the force. This support is primarily in the fields of logistics, personnel services, and health services. The logistics combat function also includes functions to build and maintain lines of communications and facilities. Sustaining the fight requires all CSS elements to adhere to the sustainment imperatives of anticipation, integration, continuity, responsiveness, and improvisation. Logistics supports close, deep, and rear operations simultaneously. Commanders integrate CSS units into the battle command system so they can shift support effort to the critical place and time to weight the battle.

Battle management helps commanders identify and avoid NBC hazards on the battlefield. NBC defensive procedures limit exposure to NBC attacks. These procedures also protect personnel and supplies from NBC contamination. Where protection is not possible, NBC defense calls for decon of necessary materiel to continue the fight.

CSS units conduct their basic functions of sustaining, manning, arming, fueling, fixing, transporting, and protecting under the concealment of obscurants. Obscurants allow them to continue operations to support the force.

Many logistics functions become more of a burden under NBC conditions. Medical units must implement systems to treat and evacuate casualties.

Commands identify functions and services available from host nation assets. US units train and equip mission-essential personnel, both US and host nation, to ensure survival.

Battle Command

The command and control system enables the commander to prioritize and allocate assets to use and sustain combat power. It is a tool that enables him to transform potential combat capabilities into combat power.

The command and control system —

- Is flexible, redundant, and survivable to synchronize combat operations and requirements for CS and CSS.
- Allows the commander to sense clearly the total battle and then transmit orders to adjust quickly and take advantage of a threat weakness.
- Is responsive throughout the area of operations, controlling units in close, deep, and rear areas simultaneously.
- Provides the commander with a capability to move and mass his combat power in a manner that helps the destruction of the threat before he can mass.

Battle management of NBC functions supports battle command by providing needed timely information to the commander. Battle management provides a current picture of NBC hazards and vulnerabilities. It provides battlefield information to direct NBC defense, nonlethal, and smoke operations.

The commander's decisions on NBC defensive measures, such as operational exposure guidance (OEG), MOPP levels, and decon go through the battle command system. Some NBC defensive principles apply directly to the commander's actions. For example, under NBC conditions leaders must carefully pace themselves, delegate responsibilities, and observe a strict work-and-rest regimen. These procedures preclude dehydration and heat stress that might result in poor performance or physical exhaustion.

Other NBC defensive principles that affect the entire unit, such as type and timing of decon, stem from METT-T. Leaders must understand the principles to decide when to decontaminate and at what level.

Leaders must also be prepared for the stress and confusion created by enemy smoke and flame operations. Command and control (C²) becomes more difficult when smoke conceals key events. Similarly, the psychological impact of flame weapons may also impact C² activities. Commanders must

quickly implement countermeasures to reduce the impact of enemy smoke and flame operations.

NUCLEAR, BIOLOGICAL, AND CHEMICAL WARFARE

Although chemical operations do not compose a combat function, NBC is a condition of warfare. Forces conduct combat operations in the presence of enemy nuclear-, biological-, or chemical-capable systems.

Under the threat of enemy WMD, the commander must implement NBC defensive measures. Some of these measures impact his available combat power. For example, on the nuclear-threatened battlefield the commander weighs the advisability of massing or dispersing his forces. Massing increases his immediate combat power but presents a good target for enemy WMD. Dispersion reduces his vulnerability to NBC strikes but increases his risk of defeat in detail by conventional forces and challenges his command and control system.

In a similar manner the commander may respond to a chemical or biological threat by directing his personnel to don MOPP. MOPP provides protection against chemical or biological hazards, but degrades combat effectiveness. Chapters 3 and 4 describe vulnerability analysis and the principles of NBC defense.

When friendly nuclear weapons have been released, the commander may use them to isolate a unit's close operations area and destroy, divert, or halt movement of enemy reinforcements. Nuclear weapons can also defeat and disrupt follow-on echelons and create offensive opportunities. JP 3-12, FM 100-30 and FM101-31-1 describe nuclear operations.

Limited visibility will also be a battlefield condition. Both sides will use smoke and obscurants to enhance combat power and reduce the enemy's combat power. Relative combat power may be changed directly by diverting resources or indirectly by changing the effectiveness of friendly and enemy weapon systems. Forces will also use flame weapons to increase combat power. Chapter 5 describes smoke/obscurant use and countermeasures, flame operations and defense.

Part Two
Operating Principles
 Chapter 3
Battle Management

"Combat decisions that had little reference to gas warfare often resulted in incurring or aggravating gas casualties."

"... gas instructors reminded their students that 'in case of gas attack, there are only two classes of soldiers, the quick and the dead.'"

**Chemical Warfare in World War I:
 The American Experience 1917-1918**

Battle management under NBC conditions consists of actions that provide US forces with an operational and tactical advantage over their adversaries. Battle management requires direct involvement of the chemical leader or staff officer, who integrates chemical operational elements into the commander's concept of the operation. These elements are —

- Battlefield assessment and risk analysis.
- NBC warning and reporting.
- NBC recon, decon, and smoke operations.
- Nuclear employment operations.
- Flame operations.

Chemical leaders or advisors ensure proper chemical planning measures are incorporated into appropriate staff estimates. They ensure the flow of NBC information supports the current and future battle planning process. Battle management requires effective working relationships with the primary staff and special staff elements such as the air defense, fire support, engineer, aviation, and air liaison officers.

LEVELS OF WAR

Battle management at theater strategic and operational levels provide theater and operational-level commanders information on the enemy's tempo of operations under NBC conditions. It provides a "near-real time" picture of enemy NBC capabilities. This information allows commanders to adjust their plans based on NBC hazards and friendly opportunities for nuclear operations.

Battle management at the tactical level of war enables the tactical commander to continue effective battle operations under NBC conditions. It also provides a "near-real time" portrayal of enemy NBC capabilities at brigade, division, and corps levels. It specifically helps units and soldiers avoid enemy NBC attacks and limit contamination. It allows rapid dissemination of information on required protective measures. It provides early warning of NBC attack to units and soldiers. It helps commanders obtain the chemical assets they need to accomplish their missions.

BATTLE MANAGEMENT ACTIVITIES

Battle management is equally important for combat, CS, and CSS units. It may call for chemical specific actions, such as planning for a thorough decon contingency mission. Alternatively it may involve actions that are not specifically chemical in nature. These actions could include monitoring a subordinate unit's status or passing intelligence information.

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Chemical unit commanders and chemical advisors at every level conduct battle management activities.

Chemical Units

Chemical brigades, battalions, and companies have expertise and sources of NBC information beyond those of a nonchemical unit. So they have many opportunities to influence battle management under NBC conditions. Chemical units occupy a special role in battle management. The chemical unit commanders work closely with the maneuver commander and S3/G3 on NBC requirements. They position chemical assets to support the maneuver commander's concept of operations. Chemical units gather information about a wide area of the battlefield. They feed information on NBC hazards into the S3/G3. They help verify enemy first-use of agents. Chemical unit functions are described in Chapter 7 of this manual.

Chemical Officers and NCOs

Mission accomplishment under NBC conditions requires "near-real time" collection and dissemination of NBC information. Units are authorized chemical officers and NCOs to facilitate operations under NBC conditions. As part of the responsibilities (see Appendix B of this manual) the chemical officer or NCO—

- Assesses friendly vulnerability.
- Receives, collates, and transmits NBC reports.
- Recommends the use of assigned or attached chemical units.
- Provides support for nuclear offensive operations.

Battlefield Assessment

Before the battle, commanders give their concept of the operation to their coordinating staff officers. The chemical staff officer works closely with the coordinating staff as they prepare staff estimates based on the commander's guidance. As soon as the first operation order (OPORD) is published and the battle progresses, commanders and their staffs continually plan and/or improve the current, and future phases of the battle. The chemical advisor coordinates with the following staff officers on NBC defense, smoke, and flame issues.

Personnel Officer (S1/G1-AG)

The S1/G1-AG and chemical staff assess the probability and impact of NBC-related casualties. They also need to assess shortfalls of NBC military occupational specialties (MOSS) and NBC personnel

readiness issues. This is especially critical when a majority of our NBC forces are Reserve Component, arriving in theater at various times, and spread over echelon above corps (EAC), corps support command (COSCOM), and divisional units. The S1/G1-AG and medical officer ensure field medical support is available and prepared for an NBC attack. They advise the commander on the medical effects of NBC weapons, treatment and protection available. The medical officer provides recommendations on associated environmental concerns, such as heat stress in MOPP. The chemical staff checks with the S1/G1-AG on the impact of NBC casualties on the unit throughout all phases of operations. The S1/G1 also monitors the OEG of units in coordination with the chemical officer and surgeon.

Intelligence Officer (S2/G2)

The chemical staff works with the S2/G2 on weather and terrain data. They assess whether environmental factors are conducive to enemy use of NBC weapons or friendly use of nuclear weapons. The S2/G2 information requirements include enemy situation and ability to use NBC weapons. The chemical staff aggressively supports the S2/G2 in the development of PIR. He assists in the IPB process for all phases of operations, determining and/or evaluating enemy capabilities, types of agents, types of obscurants and sensors, protective posture, line-of-sight influences on direct fire, and friendly vulnerabilities to enemy strengths. The S2/G2 also provides information on enemy vulnerability to friendly operations (for example, smoke and obscurants).

Operations Officer (S3/G3)

The chemical staff recommends proper MOPP guidance, troop safety criteria, and OEG. They also recommend priorities for limited NBC defense resources to the S3/G3 through all phases of operations. The chemical staff supports the battle managers (S3/G3) in several ways. They recommend task organizations for chemical units, coordinates smoke, decon, and NBC recon with chemical units, and provide guidance on flame operations.

Further, the chemical staff advises the commander on the impact of NBC-related attacks on the current, and future concept of operations. They also provide input to the maneuver commander reference nuclear target analysis, hazard predictions, vulnerability analysis, control of chemical units, mitigating techniques, and recommending priorities for actions such as decon or NBC recon support or chemical defense equipment

(CDE) resupply. The chemical staff recommends to the S3/G3 decon and smoke support assets required for vulnerable rear area targets. These targets include MSRs, maintenance, and supply facilities.

Logistics Officer (S4/G4)

The chemical staff must coordinate with the S4/G4 concerning MOPP gear, decontaminants, and resupply requirements throughout all phases of operations. The S4/G4 and chemical staff officer must know the rate and extent of the unit's decon capability. They also must plan to decontaminate contaminated supplies or equipment. In addition, the chemical staff officer keeps the S4/G4 abreast of any reported NBC contamination to MSRs, critical supply and maintenance facilities that affect unit sustainability. He also advises the S4/G4 on ways to limit the need for decon of supplies, which includes the use of disposable protective wraps or covers.

Civil Affairs Officer (G5), Public Affairs Officer (PAO)

The chemical staff works with the G5 on estimating the impact of NBC events on the civilian population in the unit's operational area. Psychological operations are also considered when estimating the impact of NBC events. Mass population movements impact mission accomplishment. The chemical staff and the FSCOORD coordinate with the G5 when planning targets for nuclear weapons to avoid collateral damage to civilian population centers, if possible. The G5 advises on appropriate preclusion overlays to assist in target analysis. The chemical staff coordinates with the G5 for integration of host nation assets into decon operations, such as field expedient decon equipment and supplies (steam cleaners and bleach), fire trucks, and wash racks. They also consider the integration of field expedient NBC protective shelters, such as existing buildings in local population centers. The chemical staff and the medical officer coordinate with the G5 for availability of host nation hospitals for the treatment of NBC casualties.

The chemical staff works with the PAO to inform the local civilian community of safety precautions or evacuation routes. The chemical staff also provides the PAO with information concerning the effects of enemy use of WMD. Information, as approved by the Unified Command PAO, is used to educate US and international populations on the effects of such weapons and the facts surrounding their use. The

information is also used to keep soldiers aware of the types of NBC weapons used.

Engineer Officer

The chemical staff works with the engineer staff to identify NBC obstacles and plan for the use of smoke and obscurants at river crossings sites and obstacle breaching. The chemical staff coordinates engineer support for NBC decon and survivability operations. Smoke, obscurants, and flame weapons are considered necessary to form or reinforce the unit's obstacle plan.

Fire Support Officer (FSO)

The chemical staff works with the fire support officer on the effects of friendly nuclear attacks. The FSO and chemical staff work together to nominate nuclear targets, conduct target analysis, and provide recommendations to the commander on use. At the battalion/brigade level the chemical staff and FSO also work together to plan the use of obscurants and riot control agents.

Air Liaison Officer (ALO)

The chemical staff works with the air liaison officer to provide information, as needed, on obscurant use and NBC defense protection measures for supporting Air Force personnel. The chemical staff also provides needed information to the ALO on chemical downwind hazards. In coordination with logistics personnel, the ALO and chemical staff assist with immediate airlift requirements for needed stocks such as chemical defense equipment. The chemical staff also coordinates with the ALO on use of friendly nuclear strikes.

Air Defense Artillery (ADA) Officer

The chemical staff and ADA officer coordinate to exchange information on smoke use, NBC defense, and chemical downwind hazards from enemy NBC attack. ADA units can also provide needed data for NBC reports as part of the system of designated observers.

Aviation Officer

The chemical staff and aviation officer coordinate to exchange information on smoke planning and execution, NBC defense, and chemical downwind hazards. NBC survey requirements are also closely coordinated. Coordination, as needed, is also

provided to logistics personnel on aerial resupply of critically needed supplies.

Provost Marshal

The chemical staff and provost marshal coordinate and exchange needed information on NBC defense, especially needed data on NBC identification, detection, and warning. Timely information exchange on NBC defense is especially important for battlefield circulation control. Traffic control points should be well informed on the location of any contamination.

Vulnerability Analysis and Reduction

NBC vulnerability analysis is an important part of battlefield assessment and risk analysis.

Commanders, with staff input, assess their units' vulnerability to NBC attacks and obscurant use. Commanders determine the protection of the units versus the enemy's capability to use WMD. They estimate the likely impact of NBC attacks, and based on the concept of the operation, determine methods of reducing any impact to allow mission accomplishment. A separate vulnerability analysis is made for a nuclear, biological, and chemical attack because of the specific nature of each type of use. For a nuclear attack commanders consider the size and location of units and sensitivity of equipment. For a biological or chemical attack, they consider the protection available and the type and the amount of agent employed.

Commanders reduce vulnerability to NBC weapons through the use of active and passive measures. (Active measures are those taken to find and destroy either the munitions or the delivery systems; passive measures are those taken to avoid or reduce the effects of NBC weapons.)

Commanders assess their units' and the enemy's vulnerability when operating in an obscured environment. This analysis requires an understanding of Threat smoke capabilities and what types of obscurants will degrade friendly target acquisition and guidance systems. In addition, commanders determine enemy vulnerabilities to friendly obscurants. They base this determination on what the friendly spectral obscurant capability is and what systems it will defeat.

Identifying and Targeting Enemy NBC Weapons and Delivery Systems

Based on the commander's PIR, the S2/G2 directs the collection, evaluation, and production of intelligence for identifying and targeting enemy NBC weapons and delivery systems.

Targets are identified which contribute to the success of the enemy's battle plans, and the most effective attack asset is used. The intelligence cycle estimates enemy capabilities, courses of action, and locations of the enemy's various units. These estimates form the basis for identifying high-value targets and predicting enemy intentions. A target analyst reviews probable enemy courses of actions (allows the start of preliminary targeting). The target and intelligence analysts estimate a correlation between an expected event within the geographical location and the time the event is expected to take place. Target analysis for nuclear weapons is a continuous process. The focus of nuclear planning, at any level, is command guidance. Amplifying guidance, as well as changes and modifications to the original guidance, may be generated by the staffs and commanders when required by the changing battlefield situation. command guidance for targets using nuclear weapons includes intent, casualties desired, amount and duration of contamination, and degree of assurance required.

NBC WARNING AND REPORTING SYSTEM

This section implements STANAG 2103, reporting Nuclear Detonations, Biological and Chemical Attacks, and Predictions and Warning of Associated hazard Areas (ATP 45)

An integral part of battle management is an NBC warning and reporting system (NBCWRS). This system provides commanders information on NBC hazards that could profoundly affect their concept of operations. The NBCWRS is used to rapidly report an NBC attack. These reports are transmitted to higher, subordinate, and adjacent headquarters. They inform these headquarters of predicted and actual contamination within their area of operations. Each report has a specific purpose and uses standard codes to shorten and simplify the reporting process. See

Figure 3-1 for a brief explanation of the formats and letter codes for the six standard reports (NBC 1

through 6). A detailed explanation appears in FM 3-3 and 3-3-1.

LINE	NUCLEAR	REMARKS
A	Strike serial number	Assigned by NBC center
B	position of observer	Use coordinates Universal transverse mercator (UTM or place)
C	Direction of attack from observer, to include unit of measure	Deg magnetic north (DGM) or (MLT) Deg true north (DGT) or mils (MLT) Deg grid north (DGG) or mils (MLG)
D	Date-time of detonation	Use Zulu time
E	NA	
F	Location of area attacked	Use grid coordinates (or place). State whether the location is actual or estimated.
G	Suspected or observed event and means of delivery or kind of attack	State whether attack was by artillery, mortars, rockets, missiles, or bombs.
H	Type of burst	Specify air, surface, subsurface or unknown.
I	NA	
J	Flash-to-bang time	Use seconds
K	Presence or absence of crater and diameter	Send in meters
L	Cloud width at H + 5 minutes	State whether measured in degrees or mils.
M	Stabilized cloud top or cloud bottom angle or cloud top or bottom height at H + 10 minutes.	State whether angle is cloud top or cloud bottom and whether measured in degrees or mils. State whether height is cloud top or cloud bottom and whether measured in meters or feet.
N	Estimated yield	Send as KT.
O	Reference date-time for estimated contour line when not H + 1 minute.	Used when contours are plotted at other than at H + 1 minute.
P	Radar purposes only. PA—Coordinates of points to outline external contours of cloud. PB—Downwind direction of radioactive cloud in degrees or mils.	
PAR	Coordinates of external contours of radioactive cloud.	Six-digit coordinates. Letter R identifies RADAR set.
PBR	Downwind direction of radioactive cloud and unit of measure.	Deg magnetic north (DGM) or mils (MLM) Deg true north (DGT) or mils (MLT) Deg grid north (DGG) or mils (MLG) Letter R identifies RADAR set.
Q	Location of reading	UTM or place
R	Dose rate or actual value of decay exponent.	State dose rate in cGyph. See sample NBC 4 for terms associated with this line.
S	Date-time group reading	State time identification test sample or reading was taken.
T	H + 1 date-time group	NBC 5
U	1,000-cGyph contour line	Plot in red.
V	300-cGyph contour line	Plot in green.
W	100-cGyph contour line	Plot in blue.
X	20-cGyph contour line (30 cGyph contour line is used by other NATO forces).	Plot in black.
Y	Direction of left and right radial lines.	Direction measured clockwise from grid north (GN) to the left and then to the right radial lines (degrees or mils, stated which), 4 digits each.
Z	Effective wind speed Downwind distance of zone 1 Cloud radius (Include unit of measure for each category.)	3 digits—effective wind speed (kmph or knots). 3 digits—downwind distance of Zone 1 (km or nautical miles). 2 digits—cloud radius (km or nautical miles) If wind speed is less than 8 kmph, this line contains only the 3-digit radius of one 1 (km)
ZI	Used only for friendly bursts.	3 digits—Effective downwind speed: 4 digits—Effective downwind Zone 1 distance in 100s of meters. 4 digits—Effective downwind Zone 2 distance in 100s of meters. 3 digits—Cloud radius in 100s of meters.

Figure 3-1. NBC reports.

NBCWRS Management

The process of reporting NBC data involves units at every echelon. These units must establish controls on handling NBC information. Without such controls too much raw data may flood the communications system. Uncontrolled NBC message traffic may overload communications and disrupt tactical operations.

Information Collection

NBCWRS management is effected by the information available and personnel available to collect it. Information may be immediate without detail, such as the first report by an observer of an NBC attack. Information obtained by monitoring, surveying, and reconnoitering provides location, type, and strength (radiation) of the hazard.

Observer reports (NBC 1) provide initial information about the attack and is the most widely used. This information allows the NBC center (NBCC) (EAC, corps, or division) to predict the location of nuclear and chemical hazard contamination. This prediction (NBC 3 report) is only an estimate of where the hazard area will be. The unit standing operating procedure (SOP) should designate primary and alternate units for observing and reporting nuclear attacks. Different observers may be designated as the battlefield situation changes. The designated observer system provides the essential data for hazard location predictions and nuclear damage assessment. The NBCC specifies the precedence of the report and the primary and alternate means of communication. Observers are selected to provide total coverage. This coverage requires ground and aerial observers (see FM 3-3-1 for more information on ground and aerial observers). All units are required to record their observations concerning nuclear strikes in the prescribed format. Nondesignated units do not send reports unless specifically requested by the NBCC to do so.

The NBCC requires feedback from units to determine the exact location of contamination. It makes this determination from monitoring, surveying, and reconnoitering (NBC 4) reports. Initial monitoring reports, providing location of contamination, are forwarded to the NBCC. If additional information is needed, the NBCC recommends a unit (because of its location or capability) be tasked to obtain it.

Collecting NBC information is a joint effort between units and the NBCC. The NBCC plans for and directs collection efforts, in coordination with the

intelligence community, while units collect this information.

Information Evaluation

Collected NBC data are evaluated and used as battlefield intelligence. The NBCC is the primary evaluation center. Units and intermediate headquarters use raw data to do quick, simplified evaluations. These results should be used until the detailed evaluations arrive from the NBCC.

Information Transmittal

Critical NBC reports (observers' initial report) usually flow through command channels. However, there are exceptions—

- When the NBCC requests survey information, the unit doing the survey may report its data to the NBCC. This reporting is done during ground or aerial surveys.
- Attached units, operational control (OPCON) units, or units that provide area support report information to the supported headquarters.

The method of transmitting information depends on the tactical situation and mission of the unit. NBC reports normally pass through the operations net. Wire transmission is an alternate means. The NBCC should evaluate all possible methods of communications and recommend those that best serve the purpose.

Friendly Attack Warnings

This section implements STANAG 2104, Friendly Nuclear Strike Warning.

See FM 3-3-1 for further information on techniques and procedures. Units affected by a friendly nuclear strike must be warned whenever possible. Warnings must be encoded or sent via secure means to avoid warning the enemy. A warning may be sent in the clear only if there is no time for the enemy to react.

There are several ways to speed the warning. SOPs establish general procedures for passing a friendly nuclear attack warning and reaction to it.

Operation plans (OPLANS) can add more specific instructions about a particular operation, such as code words for a preplanned attack.

While a nuclear attack is being planned, a warning order may be given to alert troops in an affected area. They should remain alert for a follow-up message

that will cancel, confirm, or alter the warning. All of these (SOPS, OPLANs, and warning orders) allow commanders to react or hold a warning until the last moment to achieve surprise.

Friendly forces who may be affected by a strike should receive a warning. Sometimes this warning is not possible. While good SOPs help, commanders must weigh the effects of the strike on their own personnel versus the effects on an unwarned enemy. When low-yield weapons are employed in dynamic situations, operational requirements may dictate some relaxation of the warning requirement.

Target analysis determines probable effectiveness of the weapon. Troops in the open and in aircraft are particularly vulnerable; they should be warned. Blast overpressure can destroy light aircraft, and dazzle effects from a nuclear blast can temporarily blind a pilot. Warning should go to any troops or aircraft in, or likely to maneuver through, the fallout hazard area.

Deciding when to warn friendly personnel and units is similar to deciding who gets warned. Early warning gives friendly forces time to prepare. It may also cause the enemy to launch a preemptive strike against us. Commanders must weigh the factors and give the warning at the optimum time. Commanders must ensure an attack will not interfere with the operations of adjacent commands. They must ensure the attack is a coordinate effort, with conflicts resolved by higher headquarters. Early warning is extremely critical for special operations forces (SOF) elements deployed deep in the enemy's rear area. SOF normally are foot mobile and usually use special communications procedures often with fixed contact times at 24-hour intervals or more. As soon as a nuclear strike is contemplated that may affect deployed SOF elements, it is imperative that their controlling headquarters (Theater Special Operations Command) be notified. SOF units deployed forward of the forward line of own troops (FLOT) must rely only on early warning and avoidance for protection.

The commander who orders the attack must issue the warning. For example, the division commander ordering the attack issues the warning even if corps assets are used. The G3 has staff responsibility for issuing warnings for friendly attacks. The corps or division army airspace command and control element (A²C²E) is responsible for alerting aviation assets.

All nuclear attack warning messages are transmitted by the fastest means available; they are not transmitted in the clear unless troop safety makes it essential. All messages, including cancellations, must be authenticated according to signal operation

instructions (SOIs). A false message given by the enemy over our nets could seriously disrupt our operations.

Each warned headquarters notifies subordinate headquarters that might be affected.

Nuclear attack warnings do not pass below battalion level. Instead, companies receive specific instructions. These instructions must be kept brief by using SOIs and procedures written into unit SOPs. They must include code words indicating an attack and a brief prearranged message or brevity code to take specific actions, such as move or go into a protective posture. The SOP should include time limits for these actions and the expected time of attack.

All unit SOPs should include specific methods for passing warnings. These SOPs should include procedures for preattack, attack, and postattack actions.

Unit SOPs should also include specific methods for canceling warnings. Units previously warned are notified by the fastest secure means available. The notification gives lines Alfa and Delta from the nuclear warning message followed by the word "Canceled" (see FM 3-3-1).

NBC RECONNAISSANCE, DECONTAMINATION, AND SMOKE OPERATIONS

Chemical units can provide NBC recon, decon, and smoke support at all levels.

Chemical units are employed based on the concept of operations. Synchronized NBC recon, decon, and smoke operations begin with planning, preparation, and teamwork.

Chemical staff sections (EAC, corps, and division) play an important part in the use of chemical units. These staffs are involved in recommending mission priorities and task organization of supporting chemical units, and planning logistical requirements for chemical unit support.

Units evaluate the need for external NBC unit support (recon, decon, and smoke) before submitting requests. The chemical staff provide recommendations to the S3/G3 on possible NBC recon, decon, and smoke operations. Evaluation requests or recommendations become mission

requests. They are coordinated with the S2/G2, S4/G4, and chemical unit commander for all chemical unit missions. Requests coordinated with the FSCoord, staff weather officer (SWO), ALO, ADA, and engineers for smoke support missions. Chemical units are task organized to provide full use of available assets.

Once chemical unit support is arranged, use is based on the combat power multiplier contribution and synchronization with maneuver.

EAC, corps, and division chemical staff sections constitute the technical and planning chain of command for chemical units. The chemical battalion commander and his staff are the tactical chain of command for these chemical units. Chemical staffs are responsible for advising or recommending to the EAC, corps, and division commander and/or G3 concerning the following—

- What the chemical mission priorities should be.
- How the chemical unit should be task organized.
- What the support, logistical requirements, and priorities are for the chemical unit.

EAC, corps, or division chemical unit assets are normally employed on a direct support (DS) or general support (GS) basis. The basis depends on—

- Commander's intent.
- Staff recommendations.
- Major subordinate unit mission requests.
- Higher headquarters directives.

Chapter 7 and FM 3-101 provides more details on chemical organizations and their command and support relationships.

NUCLEAR EMPLOYMENT OPERATIONS

The primary objective in using nuclear weapons is to end war on terms acceptable to us and our allies.

Nuclear weapons should be integrated with other forms of fire support in a combined arms, joint service approach. Conventional and nuclear weapons must be thoroughly integrated—

- To alter the course of the battle positively and persuasively.
- To preclude the enemy's achieving its objective.
- To ensure the success of the attack by US, North Atlantic Treaty Organization (NATO), or allied forces.

EACs allocate nuclear weapons to major maneuver commanders— normally corps commanders. Allocation is for a specified purpose, period of time,

or phase of an operation. Depending on the concept of operations, these commanders may further delegate employment authority to subordinate commanders.

The use of nuclear weapons in battle to achieve US political goals depends on political and strategic decisions made by civilian authority at national and NATO levels. Regardless of political motives, the military perspective should always be to integrate nuclear fires into the units' plans and support the scheme of maneuver and the campaign. See JP 3-12, FM 100-30 and FM 101-31-1 for more information and discussion of nuclear use and target analysis.

The principle of retaliatory response is to control escalation. US forces select retaliatory targets to discourage further enemy use. They maintain the capability for additional strikes if enemy use escalates.

Keys to controlling escalation are rapid verification of enemy first use of NBC agents and rapid processing of requests for weapons release. Verification of first use will be a politically sensitive issue. The enemy will use disinformation programs to conceal use. The United States must present its evidence in such a manner as to leave no doubt of enemy use. In a combined theater host nation corroboration of enemy use of chemical weapons greatly enhances the verification process.

Commanders should make full use of public affairs assets (the only authorized channel of communication to the American public) to inform the American public of enemy NBC warfare operations. PAO and other channels of communication (PSYOPs, US Information Agency) will be used to inform host nation, third nation populations, and other target audiences of enemy NBC operations, as appropriate. Such information should be presented in print, photographic, and electronic news media and directed at both internal and external audiences.

No universal standard for verification exists. It will depend on the extent and type of enemy attacks and on whether these attacks have sufficient impact on our forces to require a retaliatory response. Limited enemy chemical strikes will require more stringent verification efforts. This is because there will be less evidence to collect. Data will be collected and evaluated to provide critical input to the decision on a retaliatory response. Evidence to support verification is submitted before our retaliatory response. Additionally, we assess whether the enemy continues to use its CB weapons so we can determine when we should terminate our retaliatory response(s).

Principles of NBC Defense

"Only about half the men say they even smelled gas. Some men smelled TNT of the HE shells and being familiar with that and detecting no foreign smell did not put on their masks until they had breathed it for some minutes. The woods are full of various odors, offensive and otherwise, dead animals, crushed foliage, upturned earth and rotten wood, HE, and gas. ... (I have) walked for miles through these woods and passed on thru without wearing the mask, and I realize personally that the men who are in the woods day and night have the same tendency ... otherwise one would be wearing the mask constantly."

Letter from Major Hunt, Division Gas Officer, 90th Division, to the Chief of the Chemical Warfare Service explaining the high gas casualties at Saint Mihiel, France after the Division suffered 887 gas casualties in ten days. 23 September 1918

Nuclear weapons cause casualties through blast, heat, and radiation effects. They restrict terrain by blowing down trees and buildings, starting fires, or cratering. They may cause radiological contamination over a large area. Biological and chemical weapons cause serious injury or death through toxic properties. They may contaminate terrain and equipment. Effectiveness is degraded when troops don cumbersome protective clothing and equipment when operating in a toxic environment.

NBC defense is a balance of three principles—avoidance, protection, and decontamination—defend against the effects of nuclear, biological, or chemical weapons.

THEATER STRATEGIC, OPERATIONAL, AND TACTICAL LEVELS OF WAR

At theater strategic and operational level NBC defense combines US nuclear and conventional precision-strike capability to provide our deterrent

posture. If the enemy uses NBC weapons, an effective NBC defense program gives our forces an advantage in operational tempo. This advantage causes the enemy to cease NBC warfare or continue the conflict on unfavorable terms.

At the tactical level of war NBC defense enables the force to survive, fight, and win under NBC conditions. Commanders reduce the likelihood of NBC attack through avoidance measures. They disperse their forces and ensure operations and communications security; harden positions to reduce the impact of an NBC attack; detect and mark contamination; and control the spread of contamination. When units cannot avoid contamination or are in danger of an enemy NBC attack, they implement NBC protective measures. Protective measures for biological and chemical hazards, including protective mask and clothing,

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normally degrade force effectiveness and erode combat power. To restore combat power commanders decontaminate as early as possible. Immediate decon supports individual survival. Operational decon allows temporary reduction of protective posture. Thorough decon allows the unit to significantly reduce protective posture. Thorough decon can be used as a part of unit reconstitution to reduce contamination hazards to negligible levels.

A V O I D A N C E

Avoiding NBC attacks and hazards is the key to NBC defense. If forces avoid detection, they are less likely to be targeted for attack. Therefore they will not need to apply protection and decon. Although avoidance will not always be possible, all forces seek ways to reduce the chances of being contaminated. Avoiding contamination involves bypassing contaminated areas as well as avoiding detection by the enemy. The use of PSYOP can assist in avoidance of NBC attacks by targeting enemy decision-makers and public opinion with the objective of preventing NBC attacks. FMs 3-3 and 3-3-1 provides detailed guidance on conducting contamination avoidance procedures.

NBC contamination avoidance is absolutely critical, especially for light forces. To answer NBC defense questions, leaders conduct risk assessments to determine what protective measures will be directed. See FM 3-4 for detailed information on conducting risk assessments.

During risk assessment, consult area studies and the most recent intelligence summaries to determine enemy NBC capabilities. Assessments provide estimates and reports of any previous use, Enemy NBC doctrine(if any), where agents would likely be used (for example, ambush sites, airfields, troop concentrations), and the types of NBC weapons enemy forces could use. How environment (for example, desert, cold weather) impacts units and NBC weapons is also reviewed. See FMs 3-6 and 3-9 for detailed information on the characteristics and field behavior of NBC agents in different environments.

Decision points are identified for implementation of the NBC defense plan. Decision points can include elements relating to when and where to don MOPP, MOPP level, when and where automatic masking applies, or who does NBC recon of key templated areas. Decision points can be tied to events such as named areas of interest (NAI), timelines, or key events.

Based on the unit situation (static position or moving cross-country) and the chances of encountering contamination, assessments are made as to the impact of contamination. Degradation of unit effectiveness for various friendly courses of action is determined, and critical tasks are identified (for example, use of alarms, contamination marking, reporting, recon). Protective equipment needs are also determined based on risk assessment.

Determinations are made as to what equipment and supplies are needed; when resupply is needed; and where supplies are packed (for example, rucksack close for emergency use or in a resupply bundle).

Passive Avoidance Measures

Passive avoidance measures are those that a unit takes regardless of the status of NBC warfare. Good military tactics dictate many practices that will reduce the impact of enemy NBC or conventional attacks. Good training, improved positions, and dispersed forces are particularly effective in reducing the chances of an NBC attack and reducing casualties if an attack does occur.

Training

Confusion, stress, and ever-present battlefield danger place a heavy burden on soldiers' endurance, courage, and will to win. Unit commanders improve readiness and combat performance by providing soldiers with realistic integrated training. They ensure that soldiers know how to protect themselves from NBC hazards.

Camouflage and Concealment

Friendly units use measures to counter sophisticated enemy intelligence equipment used for infrared scanning, TV viewing, night vision, radio interception, and direction-finding. Good OPSEC, communications security, and electronic security protect the unit. Friendly forces use all forms of natural concealment as well as camouflage and smoke. Avoiding detection becomes a state of mind. Friendly forces actively practice camouflage, noise, light, litter, and communications discipline to avoid detection and targeting.

Hardened Positions

Units continually harden and improve fighting positions to increase cover and protection. Recon locates ready-made, hardened shelters, culverts,

tunnels, overpasses, caves, or built-up areas. Obscurants screen the hardening of shelters and engineer preparation of battle positions. When using obscurants to screen preparation of battle positions ensure that you do not actually tip off the enemy about your defense. Use a deception plan with multiple obscured areas to help conceal the friendly effort.

Dispersion

Friendly forces frequently require considerable space for dispersing and maneuvering. Dispersion protects the force and makes its intentions unclear to the enemy. Friendly forces continually analyze the effects of enemy nuclear and chemical weapons. They attempt to avoid positions that can be isolated by the obstacles created by these weapons. FM 101-31-2 contains guidance to determine how much a unit should disperse to limit the impact of a nuclear attack. Dispersion decreases the probability of a single nuclear or chemical attack destroying the entire force. Dispersion is also a countermeasure to enemy obscurants. However, dispersion may increase the risk that the force may be defeated by conventional weapon systems and maneuver forces. Many combat service support units, especially in the communications zone (COMMZ), do not have the capability to disperse. Activities such as combat equipment centers (CECs), Army depots, and area support groups (ASGs) prepare for fixed site NBC defense (see FM 3-4-1).

Active Avoidance Measures

Active avoidance measures are those taken specifically to avoid, control, or mitigate NBC hazards.

Contamination

Detection

Commanders need information about contamination hazards and locations of clean areas. They gain this information through the NBC warning and reporting system and their own NBC recon effort. As they collect data, they forward it to higher headquarters to help form the overall NBC picture. If higher headquarters requires additional information, they direct detailed surveys.

There is range of detecting and identifying devices and kits to assist the commander in detecting and identifying chemical hazards on the battlefield. The range of devices and kits begins at the individual soldier with detector paper and runs through corps and division with the M93 NBCRS (Fox). A typical company-sized organization is equipped with the automatic chemical alarms, chemical agent monitors, chemical agent detector kits, and detector paper. Table 3-1 provides an overview of the capabilities of each device or kit. NBC recon units are equipped with sophisticated detection and identification equipment.

Table 3-1. Chemical detection and identification equipment

	M8 Paper	M9 Paper	M256 CADK	M8A1 ACAA	CAM	FOX
Detects	G, V, H, L, CX	All liquid agents	G, V, H, L, CX, CK, AC	G, VX	GA, GB, VX, VX, HD, HN-3	All known agents
Agent form	Liquid	Liquid	Vapor	Vapor	vapor	Liquid and vapor
Sources of false readings	Any oil based product	Any oil based product	Extreme conditions	High power lines, vehicle exhaust, smoke	Petroleum products, ammonia, burning grass, other products	

Reconnaissance. NBC recon is a multi-echelon process that begins at the national level and ranges down to alert watchfulness of each soldier. Tactically, NBC recon is conducted as a routine part of conventional combat operations. Recon elements check for contamination in addition to looking for enemy activity. Units check relatively small areas and routes of immediate interest to unit commanders. When commanders need additional information unavailable through routine monitoring, they direct surveys of the area of interest.

NBC recon elements organic to corps and divisions are designed to conduct NBC recon missions. These elements provide early warning of contamination; determine the extent of contamination, and find clear routes of advance. They can determine if contamination remains in an area. NBC recon performs five critical tasks on the battlefield — detect, identify, mark, report, and sample. There are four NBC general NBC recon techniques — search, survey, surveillance, and sampling used during zone, area, and route recon missions.

- Search techniques are used to locate contaminated areas during recon operations.
- Survey techniques are used once the contaminated area is located. The purpose of surveys are to define the extent of the contaminated area.
- Surveillance is the systematic observation of a specific area for indications of an NBC attack.
- Sampling is the collection of material and environmental items to support intelligence collection and operational requirements. These requirements include verification that an attack occurred; identification of agents used; delivery systems; their nation of origin; and the level of CB technology involved.

NBC recon missions include —

- **Route recon.** Recon elements collect detailed information about all terrain from which the enemy could influence movement along the route. With accurate and timely contamination plots of a route, commanders can avoid contamination or direct an appropriate MOPP posture.
- **Area recon.** When a gap exists in NBC data, the unit obtains missing information with area recon. The directing headquarters must specify the area boundaries and information required. Such a directed effort might obtain detailed information concerning the terrain or enemy activity within a prescribed area such as a town, a ridge line, or woods.
- **Zone recon.** When little is known about enemy

hazards across a wide area, a unit may direct a zone recon. This action can provide information concerning routes, obstacles (including chemical or radiological contamination), terrain, and enemy forces within a zone prescribed by a boundary. Commanders assign this mission when the enemy situation is in doubt or when they need information concerning cross-country trafficability.

● **Point recon.** This mission is conducted when NBC hazard information knowledge concerning a specific terrain feature (chokepoint, bridge, and so forth) or enemy facility (NBC production or storage, and so forth) is required. A point recon is similar to an area recon, but much more specifically defined.

● **By-pass.** Recon units rapidly locate a route around contamination during combat operations. It is normally conducted in support of a mounted maneuver force during an offensive mission. The contaminated area may be located within indirect and direct fire range of enemy weapon systems. The objective of finding a clean route around the contaminated area is to allow the maneuver force to continue the mission in the lowest MOPP level without disrupting the operational tempo.

Identification. Once a unit finds an NBC hazard, the next step is to identify the hazard. Radiation is measured with the unit's radiac instruments. Biological and unknown chemical agent samples must be evacuated through intelligence channels to a laboratory facility for definitive identification. Unit personnel detect and make preliminary identification of chemical agents using kits authorized at squad level. They may also use the detector paper carried by each individual.

Contamination

Marking

Contamination is marked to warn friendly personnel. Units or NBC recon teams mark all likely entry points into the area and report contamination to higher headquarters. The only exception is where marking would help the enemy. In this event the hazard is reported to higher headquarters as an unmarked contaminated area.

When a unit enters a previously marked contaminated area, personnel check the extent of contamination and adjust plans as necessary. As the hazard area changes, the unit relocates the signs. When the hazard is gone, the unit removes the signs. The unit reports all changes to higher headquarters.

Alarms and Signals

This section implements STANAG 2047, Emergency Alarms of Hazard or Attack.

See FMs 3-3 and 3-3-1 for additional information on techniques and procedures. Alarms and signals convey warning of NBC contamination. Units use easily recognizable and reliable alarm methods to respond quickly and correctly to NBC hazards. Standard alarms, the NBC warning and reporting system, and contamination markers help give orderly warning that may also require a change of MOPP level.

Vocal Alarms. The vocal alarm for any chemical or biological hazard or attack is the word, “Gas!” Personnel hearing the alarm will mask, repeat the alarm, take cover as necessary, and increase MOPP level if appropriate. Units may send the alarm by radio or telephone.

Automatic Alarms. When an automatic chemical agent alarm sounds or flashes, the first person to hear or see it masks and gives a vocal alarm and/or hand-and-arm visual signal as described in FM 3-4 and STP 21-1-SMCT. Unit personnel relay the alarm through the area by voice, signal, telephone, or radio, if required.

Fallout Warning. The radiological monitor warns unit personnel when the dose rate reaches one centigray per hour. Unit personnel pass the alarm. Where mission allows, soldiers move to shelters with increased protection until leaders give an all-clear signal or provide directions to move.

Nonvocal Signals. Sounds of combat may mask the vocal alarm. This is why units use other signals to supplement the verbal warning. The SOI specifies these other signals. Nonvocal signals include metal-on-metal and specified horn or siren patterns. Units must ensure nonvocal signals are included in tactical SOPs.

Visual Signals. Visual signals replace or supplement sonic alarms when sound is lost in battlefield noise or the situation does not permit sound signals. Personnel may use the standard hand-and-arm signal to direct masking. Other visual signals include colored smoke or flares. The SOP or SOI specifies the exact meaning of these signals.

All-Clear Signal. Leaders give the all-clear signal after the test for contamination proves negative and unmasking procedures are completed. They pass this signal by word of mouth through the chain of command. Unmasking should be conducted, if possible, by company- size units. Elements operating more than 500 meters from the rest of the unit should conduct separate unmasking procedures. Field behavior of chemical agents may cause different concentrations of agent at several places within a unit area.

Warning and Reporting System.

The NBCWRS provides a means to rapidly send reports on NBC attacks. The reports inform friendly units of clean areas and possible contamination. For the NBCWRS to be effective, units must send information on first use by the fastest communications means available. First use reports require FLASH precedence. Units send subsequent information by any reliable communications means.

Contamination Control

To maintain freedom of action, friendly forces can bypass contamination or practice mitigation techniques. Mitigation techniques include leaving nonessential forces behind, encapsulating personnel and critical items, and covering equipment. If friendly forces are already in contamination, they can control exposure by relocating to an uncontaminated area and decontaminating as appropriate.

Bypassing. Bypassing is the preferred method of limiting or avoiding contamination. Soldiers mask when passing near but do not normally require MOPP. Additionally, they avoid contamination on vehicles and equipment. The unit may don protective clothing for a bypass to ensure freedom of maneuver in an emergency situation.

Leaving Personnel and Equipment. When the mission requires entering a contaminated area, the unit should leave non-critical personnel and equipment to prevent exposing the entire unit to contamination. In some cases, the unit will setup a decon site for use on return.

Encapsulating. Anything carried outside a vehicle can become contaminated. Units should place vital equipment inside combat vehicles or shelters. Personnel should assume an appropriate level of

MOPP or enter shelters. Shielding reduces exposure to radiological hazards.

Covering. Units may cover equipment with tarps, plastic bags, or earth. If possible, personnel leave equipment in its original container (such as an ammunition can).

Relocating. The unit commander should take immediate action to determine the type of hazard. For skin contact hazards the unit must take appropriate action to protect personnel and limit contamination spread. The commander will analyze the situation to determine if relocation to an uncontaminated alternate location is necessary and/or possible.

In preparing for unit relocation, NBC recon teams locate contamination along proposed routes. The commander selects a route that provides freedom of maneuver and minimizes contact with contamination. Sound tactical movements are conducted according to METT-T.

PROTECTION

A unit may become contaminated because of direct NBC attack or because mission causes them to enter a contaminated area. In either case NBC protection is an integral part of operations. Avoidance and protection are closely related. Techniques that work for avoidance also provide protection. However, there are four broad groups of activity that comprise protective measures. They are hardening positions and protecting personnel, assuming MOPP, reacting to attack, and using collective protection. FM 3-4 provides detailed guidance on conducting NBC protective procedures.

Hardening Positions and Protecting Personnel

Hardening includes anything that makes a unit more resistant to the effects of enemy strikes. This reduced vulnerability makes a unit a less lucrative target. Hardening includes readying positions, readying personnel, and positioning alarms and monitors.

Readying the Positions

Hardening of positions includes all actions to make them more resistant to the blast effects of conventional or nuclear munitions, to the heat and radiation of nuclear weapons, and to the contamination of biological or chemical weapons.

Foxholes and bunkers with strong waterproof overhead cover provide excellent shelter. Tanks and other armored vehicles in defilade are good NBC shelters. Existing natural and man-made features, such as caves, culverts, tunnels, and empty storage bunkers, offer expedient shelter. Shelters do not always adequately protect against vapor hazards. In fluid battlefield situations each unit establishes a command post in a protected or built-up area. They provide maximum protective shelter for off-duty personnel and critical equipment. Route recon locates handy shelters, such as culverts and overpasses. Commanders schedule stops near these shelters.

Readying the Personnel

Ordinary garments offer significant protection from flash burns of a nuclear explosion. Under BNW conditions personnel use gloves, scarves, and headgear to protect normally exposed portions of the body. Under the threat of enemy chemical or biological attacks leaders ensure protective equipment is prepared and readily available. They ensure that the unit maintains good field sanitation and personal hygiene. Additionally, leaders ensure soldier readiness to operate in special environments (desert, cold weather, NBC). FMs 3-3-1, 3-4, and 3-5 provide detailed information on operations in these environments.

Positioning Alarms and Monitors

The NBCWRS warns units of attacks in other areas. Units position organic systems to detect chemical contamination or nuclear fallout. They position alarms upwind of friendly positions. Unit personnel place detector paper in positions that give maximum exposure to chemical agents. Leaders disperse radiological monitoring teams for best coverage of potential radiological contamination.

When moving, the commander determines the protection required for drivers and crew members. Alarms should be mounted on the exterior of the upwind vehicle. Although this method will not give the vehicle occupants advance warning of a hazard (since they are collocated with the alarm), it will provide verification of a hazard to the lead vehicle's masked personnel. These personnel can pass the alarm to other elements who will pass through that area. They will also observe the area closely for liquid contamination.

Assuming Mission-Oriented Protective Posture

MOPP is the flexible use of protective clothing and equipment that balances protection with performance degradation. Wearing MOPP can cause heat and mental stress and reduce efficiency. The higher the MOPP level, the more protection it provides, but the more it degrades performance. The commander must weigh the needs of individual protection against unit efficiency. MOPP is based on threat, temperature, work rate, and mission.

Commanders must balance the probable number of heat casualties in MOPP against the possible number of chemical casualties among unprotected troops. Heat casualties are likely when soldiers in MOPP gear are performing hard, physical work under stress of combat. Leaders establish an initial MOPP level before the mission and adjust it as the situation changes or new intelligence is received. Leaders must also consider the serviceability and protection offered by overgarments. For example, the battle dress overgarment (BDO) should be exchanged within 24 hours after exposure to liquid chemical agent. See FM 3-4 for further information on individual protective equipment.

Using MOPP requires judgment. Leaders constantly balance the amount of protection needed against the urgency of the mission. As MOPP level increases, mission efficiency decreases. Mission and performance degradation are unavoidable while in MOPP. Physical skills degraded include: fine and gross motor skills, vision, hearing, and stamina.

Wearing protective gloves reduces ability to grasp tools and manipulate controls. Wearing MOPP slows movement. Wearing the mask reduces visual acuity and peripheral vision. Wearing the hood reduces hearing.

Although some mission degradation is unavoidable, acclimation and training help reduce performance degradation. MOPP impacts the better trained individual soldier's performance less than the poorly trained or undertrained. Proper training also reduces psychological stress.

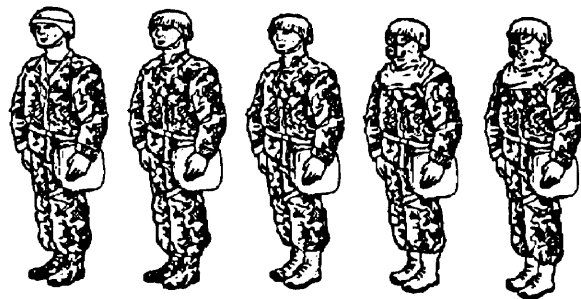
Flexibility

MOPP is not a rigid procedure that puts everyone at the same level. To maintain the balance between protection and efficiency, leaders apply MOPP with common sense. Theater and corps commanders use strategic and tactical intelligence to determine the probable initial use of nuclear, biological, or

chemical weapons. They consider the operational and logistical burdens NBC warfare would impose upon the theater of war. On the other hand, junior commanders and leaders are most aware of the difficulties MOPP can impose on the local situation.

Army operations doctrine emphasizes that subordinate leaders must take the initiative by independent action within the overall plan. Therefore, the primary responsibility of higher-level commanders is to provide subordinate commanders the threat information needed to set the most appropriate MOPP level for their mission.

When commanders provide MOPP guidance, they should not set levels so high as to limit the flexibility of their subordinates. Commanders should take care not to impose high MOPP levels over large areas merely as a precautionary measure.



MOPP Analysis

Leaders, generally at battalion level, conduct a MOPP analysis based on the unit's particular situation. The analysis finds the balance between reducing the risk of casualties and accomplishing the mission. Commanders must recognize the significant increase in time required for mission execution in MOPP3 or MOPP4 and anticipate the effects of that degradation on subsequent missions. Leaders must also understand the increased water requirements. The use of MOPP involves risk; the better commanders are at analyzing their units' needs for protection, the lower their units' risk. FM 3-4 contains a detailed discussion on MOPP analysis and water requirements.

Leaders must carefully analyze the factors of METT-T for their situation whenever MOPP is considered. MOPP analysis, in conjunction with METT-T, enables leaders to select the appropriate MOPP level. During MOPP analysis the commander considers—

- Mission.

- Work rate and its duration.
- Probable warning time.
- Terrain, weather, and time of day.
- Unit training and additional protection available.
- Alarm placement.
- Automatic masking policy.

Automatic Masking

Upon initiation of CW, commanders must decide whether personnel should automatically mask upon indication of chemical use, such as enemy artillery or rocket attacks and smoke operations. Commanders establish and continually assess policy on automatic masking as the situation and mission change. They use MOPP analysis to conduct this assessment.

Before initial chemical or biological weapons use, soldiers automatically mask when there are high-probability indicators of a chemical attack. High-probability indicators include activation of chemical alarms, color change of detector paper, aircraft spray, or chemical agent symptoms. The leaders' decision on whether personnel should automatically mask is critical in NBC defense preparation.

If intelligence sources have identified possible enemy use of biological agents, including toxins, the commander may institute automatic masking. Troops will automatically mask for conditions that may signal biological attack such as smoke, spray, mist, or presence of dead animals or insect vectors. Since some toxins will attack the skin, protective clothing should be worn.

Reacting to Attack

Personnel take immediate action to reduce the impact of an NBC attack. Following an attack they take poststrike actions to restore fighting power and prepare to continue the mission. Specific actions vary according to the type of attack.

Nuclear Attack

An enemy nuclear attack would normally come without warning. The first indication is a flash of intense light and heat. Induced radiation arrives with the light. Blast and hurricane-like winds follow within seconds. Initial actions must, therefore, be automatic and instinctive. Dropping immediately and covering exposed skin provide protection against the blast and thermal effects.

Poststrike actions include damage assessment and restoration of combat power. Leaders maintain

control and take contingency actions quickly. They restore fighting power by replacing cover and readying weapon systems. They also take action to prepare for fallout. As a minimum, unit personnel cover foxholes and shelter openings. Radiac operators begin continuous monitoring. Personnel cover exposed skin with their poncho or don MOPP. They discard this clothing during decon. Covering the mouth with a handkerchief reduces probability and amount of contaminants entering the lungs. This method is generally preferable to masking to avoid trapping contaminants in the mask filter.

Biological Attack

Personnel should treat a suspected biological attack just as a chemical attack. The protective mask provides protection against all known biological and military chemical agents. However, current detector systems will not react to biological agents.

Chemical Attack

Warning of a chemical attack may come from automatic alarm, vocal or visual signal, color change of detector paper, or symptoms observed in oneself or another. The first reaction should always be to mask and then give the alarm. Soldiers take whatever cover is readily available to reduce the contaminants landing on the body. They conduct immediate decon as necessary to remove all contaminants from the skin. Liquid chemical agents can penetrate normal clothing, leather boots, and gloves; soldiers must don MOPP4 for full protection.

After the attack, leaders adjust MOPP levels as appropriate for the type of hazard and mission. If necessary, soldiers will continue to fight in MOPP4. When time allows, leaders will direct decon so personnel can remove masks and reduce MOPP. Continued reassessments are needed of available threat information and mission requirements to ensure that MOPP levels are not set too high.

If overgarments are not available (for example, unexpected attack during a low-intensity conflict situation) at time of attack, soldiers must use field-expedient protection measures. For example, as a temporary expedient units can use their protective mask with hood, protective gloves, the issue wet weather parka, battledress uniform, field boots, load-bearing equipment, and personal weapon. However, the poncho provides protection for only one to three minutes as a cover against a liquid chemical agent.

Using Collective Protection

Collective protection (COLPRO) complements the individual protection provided by MOPP gear. COLPRO provides a toxic-free working environment for selected personnel. This environment may allow soldiers to function more effectively while continuing to wear overgarments (as with the ventilated facepiece system). Alternatively, it may allow the soldier to temporarily remove overgarments (as with an overpressure system). In either event the collective protection system is effective only as long as entry and exit procedures remain valid.

When collective protection shelters are used to provide relief from wearing MOPP, commanders establish a system for rotation of personnel. They plan for supplies, maintenance, and transportation to support the system. They establish operating procedures for the shelter that assure security, reliability, and utility.

DECONTAMINATION

The extent and timing of decon depend on the tactical situation, mission, degree and type of contamination, and resources available. FM 3-5 provides detailed guidance on conducting decon operations.

The primary purposes of decon are to stop erosion of combat power and reduce casualties that may result from inadvertent exposure or failure of protection. Combat power drops as soon as personnel don MOPP. The mask restricts the field of vision and reduces observation and target acquisition ability. Communication is more difficult. Mobility is reduced because personnel reduce their physical work rate to avoid heat stress. The longer a unit remains contaminated, the greater the chance of NBC casualties. Concomitant injuries may also increase because combat efficiency is reduced. Timely correct decon avoids problems, such as protective gear failure and heat stress. Thus, decon reduces the number of casualties that may result from an NBC attack.

Principles of Decontamination

Decon is costly in terms of manpower, time, space, and materiel. These same resources are required to fight the battle, so commanders must apply them wisely and sparingly. The following principles support this action—

- **Speed.** Decontaminate as soon as possible to restore full combat potential as soon as possible.
- **Need.** Decontaminate only what is necessary.

Consider mission, time, extent of contamination, MOPP status, and decon assets available.

- **Limit.** Decontaminate as close to site of contamination as possible to limit its spread. Do not move contaminated equipment, personnel, or remains away from the operational area if it is possible to bring decon assets (organic or supporting units) forward safely. This will keep the equipment on location, speed decon, and limit the spread of contamination to other areas.

- **Priority.** Decontaminate the most important items first and the least important items last.

Levels of Decontamination

Various methods of decon allow units to lessen the impact of an NBC attack. The following sections explain these methods in terms of levels and techniques.

Immediate

Decontamination

Immediate decon is exactly what the term implies—the immediate actions taken by a soldier to survive. Individual soldiers conduct immediate decon using supplies and equipment they carry.

STP 21-1-SMCT describes skin decon and personal wipedown in detail. Immediate decon consists of—

- **Skin decon.** Soldiers remove chemical or biological contamination from their skin with the skin decon kit. Radiological contamination is washed away with soap and water.
- **Personal equipment wipedown.** Soldiers brush radiological contaminants away and clean chemical and biological contamination from essential gear with the individual equipment decon kit.
- **Operator spray down.** Operators and crew remove contamination from all surfaces that must be frequently touched to accomplish the mission. They brush radiological contaminants away with rags or branches. They spray chemical and biological contaminants with the on-board decon apparatus.

Operational

Decontamination

Teams or squads conduct operational decon using decon equipment organic to battalion-size units. If this equipment is not available, units will request vehicle washdown through command channels. This mission will normally be tasked to the supporting chemical unit. These procedures limit the spread of contamination and allow temporary relief from

MOPP4. Operational decon makes thorough decon easier by speeding up the weathering process for chemical and biological contamination. Operational decon is less resource-intensive than thorough decon. FM 3-5 describes in detail the procedures for operational decon. Operational decon includes—

1 **MOPP gear exchange.** Teams of two or more personnel exchange contaminated overgarments for clean ones to remove gross contamination.

1 **Vehicle washdown.** The crew of the lightweight decon system (LDS) sprays vehicles with hot, soapy water to speed the weathering process. Washdown limits the spread of contamination. Forces must select decon sites that avoid contamination of surface water or drinking sources.

Thorough Decontamination

This is the most resource-intensive level of decon. It requires external support by platoon- or company-size elements assigned the mission of NBC decon. These elements require augmentation from supported units to accomplish missions. The decon unit is in charge of the decon site and operation. Forces coordinate decon sites with the host nation through civil-military liaison teams. The commander of the decon operation takes positive action to prevent runoff and contamination of civilian water sources. FM 3-5 describes in detail the procedures for thorough decon. The three techniques used in thorough decon are—

1 **Detailed troop decon.** The unit removes MOPP, monitors for contamination, and decontaminates masks with assistance from a decon unit.

1 **Detailed equipment decon.** A decon unit conducts equipment decon with the assistance of the contaminated unit.

1 **Detailed aircraft decon.** A decon unit conducts aircraft decon with the assistance of the contaminated unit.

Effects of

Decontamination

Decon has positive and negative effects on unit effectiveness. The overriding positive effect and ultimate goal of decon are the

restoration of the combat power lost when assuming MOPP. A negative, offsetting effect is a consumption of resources (time and supplies). Commanders must decide where the optimum trade-off occurs between restored power and resource depletion (See Figure 4-1).

Combat Power

Restoration

Immediate decon allows soldiers to survive and continue to fight on the battlefield. Operational decon allows the force to fight longer by reducing contamination. Soldiers may temporarily unmask under controlled conditions to eat, drink, and rest. When time permits, thorough decon restores almost all combat power of the contaminated force. However, the decon operations reduce combat power during the decon period.

Resource Depletion

All decon uses valuable resources including time. Staff estimates must include time and resupply requirements. Chemical personnel work closely with combat operators and logisticians to determine

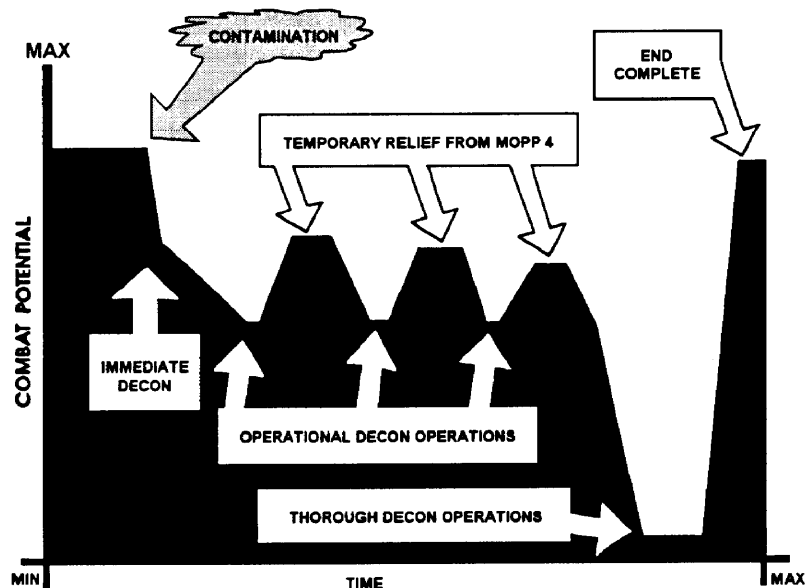


Figure 4-1. The effects of decontamination on combat power potential.

resources needed and availability. In some cases resources will not be readily available for decon. In this event the **commander may choose weathering to reduce contamination. There may be substantial time before personnel can reduce MOPP levels if weathering is allowed.**

Guidelines for Decontamination

Every decon mission is unique. Commanders use on-the-spot judgment to combine the fundamental principles of NBC defense. Leaders must—

- Understand contamination hazards and avoid contamination when possible.
- Protect forces and equipment when contaminated.
- Know how to neutralize or remove the hazards of contamination.
- Conduct only as much decon as is needed to continue the mission until more thorough decon may be accomplished.
- Leave as much combat power forward as possible during decon. When necessary, units may conduct small-group decon.

Casualty Decon

Patient decon is absolutely essential. Personnel injured from chemical munitions will be triaged separately and decontaminated before medical care is rendered. Additionally, patient decon is done as far forward as possible to limit the spread of contamination. See FM 8-10-7 for additional information concerning patient decon.

Casualty decon **presents special problems for units** and health service support personnel. Under NBC conditions, contaminated wounded soldiers create increased hazards to rescuers and health service support personnel.

On the NBC battlefield, two classifications of casualties will be encountered: contaminated and uncontaminated. Those who are contaminated may

be suffer the effects of an NBC agent, a conventional wound, or both. Some may be battle fatigue or heat casualties, induced by the stress of NBC conditions and extended time spent in MOPP4. It is important to follow proper decon procedures to limit the spread of contamination.

Casualty decon begins at platoon and company levels with individual soldiers. The individual soldier or members of their teams perform immediate decon. The casualty is tagged with a field medical card (DD Form 1380), noting the time and type of contamination. When the casualties' conditions and battle permit, they may go through a MOPP equipment exchange. When battle conditions prevent decon procedures forward, casualties may require evacuation to the battalion aid station (BAS) before decon. Patients who arrive at the BAS contaminated must be decontaminated before admission into the clean treatment area. Patient decon is performed by a patient decon team from the supported unit. The team operates under the supervision of medical **personnel to ensure no further patient injury during the decon process.**

The division clearing station (DCS), located in the brigade support area, may receive contaminated patients from the BAS or directly from areas in the BSA. The DCS also has a patient decon area. As with the BAS, the DCS is supported by a patient decon team from the supported unit.

Terrain Decon

Terrain decon maybe necessary, despite the tremendous logistical burden, at fixed sites, such as rail heads, depots, and so forth. Terrain decon may be very limited, such as to paths, specific buildings, piers, and docks. Terrain decon will occur only where operationally absolutely required. If terrain **decon is required, expedient methods such as** covering with earth or scraping may be used.

Chapter 5

Smoke, Obscurants, Non-Lethal, and Flame

"Major Murphy told me that he could not add smoke in the plan since the stencil had already been cut. That was one of the most foolish remarks that I heard during World War I."

**General George S. Patton, Jr.,
Patton's Diary, Sep 8, 1918**

Smoke and obscurants are used on the battlefield to enhance friendly operations and degrade enemy operations. All forces on the battlefield use smoke and battle-induced obscurants, such as HE artillery-generated dust. When coupled with naturally occurring obscurants, such as rain, snow, or fog, limited visibility becomes the normal battlefield operating condition.

Friendly and enemy surveillance and weapon systems use visual, infrared, or radar sensors to see the battlefield. Smoke and obscurants provide low-cost countermeasures to these systems. Smoke and obscurants can change the relative combat power of opposing forces by changing the effectiveness of their weapon systems. In addition, smoke and obscurants increase survivability and enhance force effectiveness by—

- Degrading the enemy's ability to see.
- Disrupting the enemy's ability to send visual signals.
- Concealing friendly forces.
- Deceiving the enemy.
- Sending friendly signals, including identification of forces and targets.
- Attenuating energy weapons.
- Enhancing the effectiveness of friendly weapon systems.

OPERATIONAL AND TACTICAL LEVELS OF WAR

At the operational level of war, corps and echelons above corps use smoke to conceal the location or size of mobile forces. Smoke can be used to conceal

logistics over the shore (LOTS) operations, dams, locks, and critical areas on MSRs. Large, obscurant clouds and dummy smoke can support deception plans at the operational level. Large-area smoke increases survivability of key logistics and transportation assets by degrading missile and air attack guidance systems. Smoke can conceal facilities necessary to sustain the force, such as ports, terminals, and critical rail facilities.

At the tactical level of war smoke supports the movement and positioning of forces on the battlefield. It covers the logistical support of forces before, during, and after engagements. Friendly forces use smoke to support the commander's concept of operations or counter an immediate enemy threat. Smoke disrupts enemy command and control. It degrades enemy reconnaissance, intelligence, surveillance, and target acquisition. It counters antitank guided missiles (ATGMs), directed-energy

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weapons, and laser range-finding and designating systems. It supports battlefield deception operations. FM 3-50 provides detailed guidance on conducting smoke operations.

SMOKE SOURCES

Forces tailor a variety of delivery means and munitions to produce smoke screens. These sources include—

- Projected smoke. Artillery, mortars, and multifunction rockets can deliver a dense, white smoke using white phosphorus (WP), red phosphorus (RP), and hexachloroethane (HC).
- Generated smoke. Smoke generators, smoke pots, and screening smoke hand grenades produce white smoke using fog oil (for generators) or HC (for pots and grenades). Signaling grenades produce colored smoke for identifying and marking.
- Self-defense smoke. Some US vehicles have vehicle engine exhaust smoke systems (VEESSs) that use diesel fuel to create a smoke screen. However, JP8 fuel will limit VEES effectiveness as little smoke is produced at temperatures above 32°F. Many vehicles also mount smoke grenade launchers that can create a self-protection screen within seconds. Units predetermine whether to load the launcher with a grenade that will screen unaided or unenhanced vision only (L8A3 RP grenade) or a grenade that will screen thermal imagery (M76 bispectral grenade). Friendly and enemy sensor and weapon system capabilities guide this decision.

When bispectral grenades are used, the screen can break weapons lock on thermally-guided missiles. However, the screen will also obscure the vehicle's own thermal viewer.

DELIBERATE AND HASTY SMOKE

Units at every level should plan deliberate smoke operations to support the commander's concept of operations using any available smoke source. Deliberate smoke operations are characterized by—

- Extensive planning at the command level that controls the affected area.
- Extensive coordination (including coordination with units adjacent to the areas being smoked).
- Extended periods of operation (typically hours to days).
- Significant logistics support.
- Significant support for mobility (deliberate smoke with deliberate breach and hasty smoke with in-stride

breach), countermobility, and survivability operations.

- Extensive and redundant communication.
- Alternate (back up) plans.
- Deception plans.

During deliberate smoke operations forces conceal or protect large areas (several square kilometers) behind the FLOT with smoke generators supplemented by smoke pots. They obscure point or small-area targets in enemy-controlled territory with projected smoke assets (for example, artillery, mortars, naval gunfire, and close air support rockets). Deliberate operations can consume large amounts of fuel, fog oil, and munitions. They require extensive use of relatively scarce smoke generator and artillery assets.

Battalion task forces and smaller units conduct hasty smoke operations to counter an immediate enemy tactical threat. Forces conducting these operations use the unit basic load of smoke-producing sources, augmented by rapidly responding assets like mortars, artillery, and smoke units if available. Hasty smoke operations are characterized by—

- Minimal time available for planning and executing the mission.
- Minimal coordination.
- Relatively short duration (typically one or two hours or less).
- Use of organic assets.
- Reliance in SOPs/battle drills.

During hasty smoke operations forces create local screens to support small unit maneuver or disengagement. Hasty smoke operations require rapid planning and execution. Units must still preplan the operational and logistical support for using hasty smoke.

LARGE-AREA SMOKE

Most deliberate smoke operations and some hasty operations require the generation of large obscurant clouds which may cover many square kilometers. Smoke units create large-area smoke clouds with stationary or mobile smoke generator systems supplemented with smoke pots.

Stationary and Mobile Smoke Generator Systems

Smoke units with stationary generators develop smoke plans using primary and alternate unit positions. Other smoke sources are added to enable the unit to cover a specific area or stationary target under different weather conditions. Mobile (motorized and mechanized) smoke generator systems

can make smoke while moving. To cover stationary or mobile targets they can quickly displace to create successive screens.

Echelons above corps normally use stationary smoke systems assigned to smoke units or fixed sites in the COMMZ. Corps and divisions use mobile smoke units forward of the corps rear boundary. They use motorized smoke in their rear and main areas and mechanized smoke forward. Projected smoke may supplement huge-area smoke by shortening time required to develop effective clouds.

Logistics Impact

Operations and logistics planners must consider the requirement to supply fog oil to smoke generators. Few substitutes exist for fog oil. Only basestock refined oil products (90, 100, or 150 neutral products), 10-weight and 75-weight motor oils, and SGF1 may substitute; diesel fuel and JP8 cannot. Logistics planners should consider push packages of POL to smoke units. In general, only unit distribution methods will sustain smoke units due to their lack of transportation assets. Therefore, the distribution scheme within a division may require extraordinary handling to sustain this valuable combat support asset .

BATTLEFIELD APPLICATIONS AND TYPES OF SMOKE

Friendly units use smoke and obscurants to attack and defeat enemy recon, intelligence, surveillance, and target acquisition efforts and to degrade the enemy's combat effectiveness. For example, we may fire obscuring smoke mixed with high explosives onto an enemy ATGM position to defeat its target acquisition efforts. We may fire or generate smoke between enemy echelons to degrade command and control and interfere with synchronization. We conceal our forces and positions with smoke. Smoke supports deception plans by drawing attention away from the main effort. It can mark targets or friendly positions. It protects friendly forces against directed-energy weapons and the thermal effects of nuclear weapons. It enhances friendly weapon systems when used to exploit specific enemy vulnerabilities.

Obscuring Smoke

Friendly units use smoke directly on enemy positions to confuse and disorient direct-fire gunners and

artillery forward observers. The former Soviet Army believed that obscuring (blinding) smoke on enemy positions was more effective than concealing (camouflaging) smoke over friendly forces. Their writings stated that friendly forces can cut losses by more than 90 percent by obscuring enemy direct-fire gunners and forward observers with smoke.

Screening Smoke

Friendly forces conceal positions and activities from enemy ground or air observation by using screening smoke over their own operational areas or between friendly and enemy forces. A smoke blanket, a haze, or a curtain may be used to accomplish this mission.

A smoke blanket prevents enemy observation from the ground or the air. A blanket provides excellent concealment; however, it contains such dense smoke that it restricts friendly movement and activity. Smoke blankets are very resource-intensive and sometimes disruptive for friendly activities. As a result, blankets are seldom used unless absolute concealment is needed. Friendly forces most often use a smoke haze for screening. A haze is heavy enough to restrict accurate enemy fires but is light enough to avoid significantly hampering friendly operations. On some occasions when weather conditions do not allow a haze, friendly forces may use a smoke curtain. This vertical line of smoke between friendly and enemy positions restricts enemy ground observation of friendly positions and activities. Smoke curtains may not always restrict enemy air observation.

Marking Smoke

Forces use marking smoke to identify targets or friendly forces during close air support, attack helicopter operations, and other fire support tasks. Marking smoke also supports prearranged battlefield communications for control measures, link-up operations, and tactical cues.

Protecting Smoke

Units use protecting smoke to defeat command line of sight terminal homing ATGMs, attenuate directed-energy (DE) weapons and thermal energy effects of DE and nuclear weapons. Bispectral smoke grenades can protect armored vehicles by interfering with the enemy gunner's ability to either track the vehicle or control the missile. Large-area smoke can reflect, absorb, or scatter heat and light from nuclear

weapons. Smoke is an excellent countermeasure to low-energy lasers which damage vision or optics.

ENHANCEMENT OF FRIENDLY WEAPONS SYSTEMS

Smoke and obscurants create feelings of isolation in the enemy soldier, causing stress and reducing combat effectiveness. Smoke interferes with enemy reaction to obstacles, barriers, and minefields. It suppresses enemy flash-ranging techniques. It forces the enemy to use electronic transmissions more frequently, making him more vulnerable to electronic warfare. It supports air defense by filling valleys and defiles to deny nap-of-earth helicopter routes.

TACTICAL EMPLOYMENT OF SMOKE

Commanders use all factors of METT-T to plan smoke operations. The weather-dependent nature of smoke requires intense preparation. Time of day, humidity, and wind direction are major considerations when planning effective smoke support. FM 3-50 describes appropriate planning considerations.

Commanders must know their units' ability and that of the enemy to see and fight through smoke. IPB identifies capabilities of enemy sensors and obscurants. Planners balance the degradation caused by friendly smoke against friendly and enemy surveillance and weapon systems before using smoke.

Smoke normally favors the attacker. It is particularly effective at night and other limited-visibility conditions. Smoke is most effective when used in compartmented terrain.

Smoke compresses usable areas of the battlefield. Attacking forces may remain concealed by smoke until they are less than 1,000 meters from defender positions. Although attacking forces will silhouette themselves as they emerge from the smoke at this range, the defender will have great difficulty defending against overwhelming numbers emerging from a screen close to the defensive positions.

Units should avoid placing smoke on their own lines of sight. Dust raised by HE point-detonating artillery, projected smoke and burning debris, will degrade friendly sensors. Friendly smoke should not

be allowed to thicken enemy obscurants to make friendly systems less effective.

Smoke in the Offense

Before the battle, smoke denies the enemy information about the composition and disposition of friendly forces. It screens assembly areas and defeats enemy target acquisition and surveillance. Smoke conceals maneuver and combat support forces and contributes to deception operations. Friendly forces use projected, generated, and self-defense smoke to—

- Mark targets.
- Obscure enemy gunners and surveillance.
- Degrade enemy command, control, and communications.
- Conceal passage of lines, movement to contact, and hasty and deliberate attacks.
- Conceal or restrict landing zones (LZs), drop zones (DZs), or pickup zones (PZs). (For friendly LZs, DZs, and PZs the smoke is placed to restrict enemy observation without interfering with friendly operations.)
- conceal river-crossing operations and reduction of obstacles.
- Conceal logistics operations (for example, refuel-on-the-move sites).
- Signal.
- Support deception plans.
- Degrade enemy laser designators, range finders, and weapons.
- Enhance the effectiveness of artillery-delivered minefield by concealing their visual indicators.
- Support MOUT operations.

Smoke in the Defense

In the defense, forces use smoke primarily to increase survivability and counter enemy recon, surveillance, and target acquisition. Forces use smoke in the defense to—

- Obscure enemy direct-fire gunners and artillery forward observers.
- Disrupt enemy movement and command and control.
- Conceal obstacle emplacement, preparation of battle positions, and movement to alternate positions.
- Conceal reconstitution, holding, and staging areas.
- Conceal MSR activities.
- Signal.
- Mark targets.
- Deceive the enemy as to areas of main effort and battle positions.

- Reduce the effectiveness of enemy directed-energy weapons.
- Enhance air defense by degrading nap-of-earth flight patterns and forcing the enemy to fly higher.
- Silhouette targets.
- Support MOUT operations.
- Restrict LZs or DZs.

SMOKE SUPPORT FOR TACTICAL DECEPTION

Smoke draws attention. Units use smoke to enhance deception operations, drawing attention away from the main effort and misleading the enemy about friendly force intentions. The enemy may divert forces and fires to the deception, reducing capability to mass forces against actual friendly force operations.

For example, using smoke to conceal a dummy defensive preparation and support activities confuses the enemy as to the precise location of the defense. Smoke and high-explosive preparations of dummy objectives may confuse the enemy as to the actual main attack.

Smoke should never be the only deception activity. It supports other means to portray a false picture to the enemy. Smoke enhances the realism of a display, feint, or demonstration. Radio traffic, combat noises, vehicle dust, and decoys in addition to the smoke support the deception plan. Heat sources and radar reflectors concealed by smoke add to the credibility of the deception effort.

COUNTERING ENEMY USE OF SMOKE

Enemy use of smoke and obscurants may significantly degrade friendly defensive and offensive operations. Enemy forces use smoke as a control measure to synchronize the movement of attacking forces. US forces use a variety of countermeasures to defeat enemy use of smoke and obscurants. Some combat actions common to the battlefield with or without obscurants serve as countermeasures to enemy smoke use. These include—

- Offensive operations, which disrupt the enemy's ability to conduct or support smoke operations.
- Electronic warfare, which hinders enemy movement and command, control, and communications in smoke.
- Obstacles, which disrupt enemy timetables for using smoke.

Tactical deception, which prevents the enemy from

locating (and smoking) friendly positions.

- Friendly countersmoke which may be used to confuse the enemy and prevent its effective use of smoke as a control measure.
- Counterbattery fires, which limit enemy delivery capability.

Countermeasures which enhance friendly survivability and mitigate the effects of enemy obscurants include:

- Electro-optical devices. Thermal devices will permit surveillance and target engagement through smoke. Our thermal devices will only see through visual obscurants.
- Dispersion. Dispersing forces laterally and in depth to provide multiple lines of sight (LOS) reduces the value of enemy smoke.
- FASCAM (family of scatterable mines) with smoke. Integrating smoke with FASCAM-emplaced minefield increases their effectiveness by hiding visual cues. Since minefield normally remain under direct observation and fire, friendly forces must prepare to cease smoke operations quickly and engage targets in the smoke using electro-optical devices.
- Alternate positions. Friendly forces construct alternate positions. They move to alternate positions when the primary positions become untenable. They also use these positions when LOS from the primary positions are obscured by smoke and HE-generated dust.
- Stay-behind forces. Typically the enemy will concentrate its obscurants in front of its troops. Stay-behind forces can engage an enemy from its flanks and rear after it has passed their position.
- Positioning of ground/vehicle laser locator designator (G/VLLD). Since most laser range finders and designators are susceptible to degradation caused by obscurants, units must use them in locations that offer a high probability of clear LOS. Commanders may improve fire support by placing G/VLLD in positions where the enemy is less likely to use smoke; that is, they may position G/VLLD to their front or flanks, even though LOS from these positions are more limited, to avoid obvious key terrain features that the enemy is certain to obscure.
- Positioning of observation posts (OPS). The enemy will not normally surround its forces completely with smoke. It will obscure the most likely enemy positions and LOS. Positioning OPs at extended distances to the front and flanks may provide some unobscured LOS to identify size and composition of enemy forces and support calls for fire.
- Target enemy smoke assets. Friendly forces locate and destroy enemy smoke generator units or vehicles

to strip away advantages possible with its smoke cover.

NON-LETHAL OPERATIONS

Riot control agents (RCAs) and herbicides are non-lethal chemicals which have military application. Non-lethal materials are available to the commander under specific conditions. The Joint Strategic Capabilities Plan (JSCP) is the source document for the most current employment conditions.

RCAs and herbicides are used for law enforcement, agriculture, and industry. They are not classified as military chemical agents. Their uses are covered by different policies than those that govern chemical warfare. Information on US policy regarding use of RCAs and herbicides is covered in Chapter 1.

Riot Control Agents

RCAs are compounds that produce temporary irritating or incapacitating effects when used in field concentrations. They include tearing (crying), sneezing, and vomiting agents. Tearing agents are the most frequently used RCAs.

Types

The most commonly used riot control agent, CS, is a white solid that causes a blinding flow of tears and involuntary closing of the eyes. In greater concentrations, it irritates moist skin and the respiratory tract. Other agents in the US Army inventory include CSX, CS1, CS2, and CR. One of the more recent additions to the RCA inventory is oleoresin capsicum (OC) or pepper spray. It behaves much like CS with respect to the affects on the upper respiratory system. However, OC is an inflammatory rather than an irritant as is CS. The physiological effects desired and the dissemination means available determine the choice of RCA.

Uses

RCAs are widely used for training, riot control, noncombatant evacuation operations (NEOs), and situations in which long-term affects are unacceptable. US forces disseminate RCAs in hand grenades, ring airfoil projectiles, 40-millimeter cartridge grenades, or bulk agent aerial and ground dispersers.

Protection

The protective mask protects soldiers' eyes and respiratory tracts from RCAs. Normal clothing over exposed skin can help prevent skin irritation.

Personnel decontaminate RCAs by both brushing and washing exposed skin or clothing.

Employment Operations

US forces may conduct tactical RCA operations across the range of military operations after Presidential approval.

In peacetime, the Secretary of Defense may authorize use of RCAs. Specifically, RCAs may be used on US bases, posts, embassy grounds, and installations for protection and security purposes such as riot control and evacuation of US noncombatants. The US-controlled portions of foreign installations are considered US installations. Authority for use of RCAs in peacetime situations not addressed above is covered in operations plans that are submitted for Secretary of Defense approval.

Low-Intensity Conflict

In a low-intensity conflict unsophisticated forces could use chemical agents or RCAs. In most cases these forces will have only limited protective equipment. Many units may be completely unprotected. As a result, retaliation with RCAs will be highly effective and will mitigate any advantages achieved by the enemy.

Following Presidential approval, forces can use RCAs to—

- Protect installations and bases.
- Reduce insurgent capacity for offensive operations.
- Support attack of fortified and unfortified enemy positions.
- Restrict insurgent entry into an area.
- Aid in destroying or trapping insurgent forces.
- Draw the enemy into an unfavorable situation.
- Develop more favorable conditions for offensive operations.
- Gain time without fighting a decisive engagement.
- Avoid combat under undesirable conditions.
- Aid in disengaging from combat.
- Support relocation of friendly forces.
- Supplement security along extended lines of communications.
- Assist bunker and tunnel clearing operations.

RCAs can also be effective psychological weapons in areas where superstition or fear of the unknown can

be exploited among insurgents unfamiliar with these agents.

Mid-Intensity

Conflict

RCAs could be effectively used against relatively sophisticated enemy forces in mid-intensity conflicts. Some elements of these enemy forces will have the training and equipment to withstand RCA use. Nevertheless, RCAs will still degrade enemy operations by forcing the use of that protective equipment. Protective masking will reduce the effectiveness of enemy fire and interfere with its command and control.

High-Intensity

Conflict

When approved for use in a high-intensity conflict against sophisticated and well-equipped forces, RCAs provide the commander a measured degree of force to influence the outcome of military operations. In general, RCAs would be used in high-intensity conflicts in the same manner as they are used in low- and mid-intensity conflicts. However, they will seldom be used alone.

RCAs can be used any time serious injury or death is not the primary objective of the operation. RCAs offer commanders an opportunity to inflict temporary incapacitation, degradation, and terrain restriction.

Herbicides

Historically, herbicides have enabled railroads, power companies, and farmers to control unwanted vegetation. However, the United States no longer maintains herbicides in its inventory. US forces used herbicides in Southeast Asia to clear fields of fire around base camps and along lines of communications. Using aircraft- and truck-mounted sprayers, they could spray large areas in a relatively short time. Herbicides effects usually begin to occur within several days to weeks after spraying. Friendly forces could then clear defensive perimeters containing mines, booby traps, and other munitions. US forces also used herbicides to destroy concealment vital to the enemy's survival. Herbicides uncovered enemy supply routes and base camps.

Types

Herbicides kill or alter plant growth. Plant growth regulators alter the growth rate of vegetation.

Slowing growth can keep vegetation from blocking fields of vision, such as fields of fire and avenues of approach. Speeding growth can upset the natural growth cycle of a plant, causing its death. Defoliants cause plants to shed their leaves prematurely but not kill them. When selecting a defoliant for use, planners consider the effects desired and duration rate. Desiccants kill plants by dehydrating them. Soil sterilants sterilize both plants and seeds.

Herbicides can be selective or nonselective. Selective herbicides kill only certain plant species and have little or no effect on others. Nonselective herbicides kill all plant life without regard to species.

Uses

Forces use herbicides to reduce vegetation along suspected enemy routes of advance, assembly and hiding areas, and supply routes. Aerial observers can better monitor activities if these areas are treated. Herbicides neutralize the advantages of concealment.

Limited First Use of Herbicides

Upon presidential approval, herbicides may be used in areas under US control and along the FLOT to—

- Kill the vegetation bordering roads, paths, trails, railroads, and waterways. This reduces possible sites from which friendly forces may be ambushed.
- Kill the vegetation surrounding vulnerable base camps, communications complexes, pipelines, supply points, assault strips, landing zones, and air defense sites.
- Control vegetation in fields of fire and avenues of approach. The resulting fields of fire may destroy or canalize the enemy during approaches and withdrawals.
- Destroy large areas of dense vegetation for major construction projects or for health and sanitation programs.

Retaliatory

Roles

Once an enemy uses herbicides, chemicals, toxins, pathogens, or RCAs against US or allied forces, retaliatory use of herbicides may be approved by the President. The standard against which such a request for release is measured is, "Will this use escalate the use of chemical compounds beyond the level already established by the enemy?" In the case of herbicides, the answer will probably be no, regardless of the chemical, biological compounds or agents the enemy

has used. Large-area spray missions, support of ground gaining operations, and anticrop applications in the enemy's rear areas are all acceptable retaliatory uses of herbicides. Political constraints and command guidance may rule out one or more of these applications, but all of them could be approved.

Herbicides may be used on enemy held terrain to support retaliatory operations by—

- Defoliating large-area targets to improve intelligence gathering. Defoliation increases vertical and horizontal visibility in densely vegetated areas.
- Killing vegetation on friendly objectives and suspected enemy positions.
- Destroying enemy food supplies and cash crops, when such objectives constitute proper military objectives.
- Destroying narcotic-producing crops in support of counternarcotic operations.

Herbicide operations, like all other actions in war, must be aggressively exploited to obtain the maximum benefits in terms of mission success and lives saved. Careful integration of herbicides with maneuver, fire support, engineer, and electronic warfare plans will net the greatest return. Careful use also reduces their potential to negatively impact concurrent and subsequent operations.

Presidential approval is always required to use herbicides in war, but host nation agreements may also require allied approval. Local civilian officials and civil affairs officers should be kept abreast of the effects of herbicide operations. When fighting as a member of an alliance, US forces must follow alliance policies regarding use.

FLAME OPERATIONS

Combatants have historically used flame in wars to kill, injure, or demoralize personnel and destroy equipment and structures. Flame was a major casualty-producer in World War II. For example, the incendiary raid on Tokyo in March 1945 killed more people (197,000) than the nuclear attacks on Hiroshima and Nagasaki. The human fear of fire, together with the physical damage it produces, accounts for the tactical success of flame in combat. FM 3-11 describes in detail flame operations and the construction and use of flame field expedients.

Tactical Use of Flame

Forces use flame weapons and flame field expedients (FFE) during offensive and defensive operations and MOUT.

Offensive Use

All combat scenarios should include flame operations. Light forces are well suited to use flame, including FFE. Therefore, training for LIC must include the construction and use of FFE. Training should not be restricted to FFE, but include packaged flame systems as well. The M202A1 66-millimeter FLASH is a conventional flame weapon with application in MOUT operations. Army standard flame weapons can produce casualties in bunkers, buildings, covered or open fighting positions. It can also damage vehicles and destroy combustible supplies, ammunition, and materiel. White phosphorus and thermite munitions can be used to damage and destroy combustibles. Offensive forces may use flame weapons as part of an ambush plan.

Small, portable FFE weapons are another method for using flame in the offense. Exploding flame devices no larger than an ammunition can may be prepared in advance and carried into the battle. Small offensive forces operating in remote or isolated areas may use FFE to seal off border crossings or attack an infiltration route. During deep operations portable FFE devices can destroy enemy stocks of fuel and weapons.

Defensive Use

Use flame weapons and FFE devices in the defense to--

- Reinforce obstacles.
- Augment final protective fires.
- Cover dead spaces and gaps in the defense.
- Illuminate critical areas of the battle.

Defending forces cover flame weapons by supporting fire to prevent removal or destruction by the enemy. Camouflage and concealment achieve surprise and prevent enemy observation. Defenders must check exploding flame devices periodically to ensure the firing systems, explosives, and fuel have not deteriorated, been tampered with, or removed.

FFE devices can easily be constructed for defensive purposes. Individual flame mines and directional fougasses are examples of two powerful weapons that can be used in a defensive fire plan. Both devices are suitable for front-line and rear-area defensive postures. A minefield of command-detonated FFE mines is ideal for a long-term static defense or to restrict LZ/DZ in rear areas. Light forces may also use flame in a defensive role.

Flame Weapons and FFE Devices in MOUT

Forces can also use flame effectively in MOUT. Defenders can use flame weapons and FFE devices to destroy attacking forces. Attackers may target such complexes of large cities as transportation terminals, multistory buildings, communications facilities, and subway facilities, to disrupt the defender's operations.

Defense Against Flame

Friendly forces can expect the enemy to use flame weapons. Surviving an attack of this nature may depend on how well soldiers are trained to defend themselves against flame.

Individual Protection

The primary objective of individual defense is to prevent burning fuel from contacting bare skin. Soldiers use available cover when a flame attack is imminent. Covered fighting positions and prepared positions offer the best protection. However, shelter halves or blankets may provide protection when soldiers are caught in the open. Even a field jacket will afford a measure of protection. It is important to note that fire requires and consumes oxygen. Protective covers should be removed quickly and discarded when the danger posed by burning particles, droplets, and fuel globs has passed.

Bare skin areas, such as the hands, neck, and face, are especially vulnerable to flame attacks. Special efforts must be made to protect and cover these areas to prevent serious or perhaps fatal burns.

Tent canvas and truck tarpaulins treated with fire-resistant substances will resist flame for a short time. Three canvas articles can be expected to hold burning particles long enough for personnel to escape from a prepared position that has been covered by this material.

The plastic or rubber-coated poncho and any nylon or thermoplastic material, such as the poncho liner, should not be used as cover material. These items will melt from intense heat, adhere to the skin, and cause serious injury.

Training

Thorough troop indoctrination in the enemy's flame capabilities and limitations is essential. Soldiers must be mentally conditioned to believe that ground flame

attacks can be repulsed. Commanders responsible for the training of troops must continually emphasize the difficulties the enemy will encounter in carrying out a flame mission.

- Preparation takes a great deal of time.
- Battle command is difficult.
- Enemy flame weapons are limited in range and capacity and can be identified and destroyed before they come into firing range.
- Defenders can defeat the attack by destroying key enemy personnel or vehicles before they reach an assaulting position.

Troops must be trained to recognize enemy flame equipment and weapons and any indications the enemy intends to use flame. Training must include the combat techniques the enemy uses in flame use. Soldiers must anticipate flame attacks and defend against them.

Use of Supporting Fires

The best defense against enemy flame is to identify flame weapons and destroy them before they get into usable range. Commanders may use supporting artillery, mortars, or tactical air against enemy flame weapons. They may identify the priority for destruction of these weapons in the fire plans of direct support units. Since existing flame weapons are relatively short-range, units normally engage and destroy them through precision adjustment of organic mortars. Large-area and projected smoke may also obscure friendly forces from being targeted by flame weapons.

Part Three

Planning and Organization

Chapter 6

Operational and Tactical

"Despite the pervasive impact of chemical agents on the battlefield, commanders and staffs had difficulty adjusting their thinking and planning in such a way as to make effective use of these new weapons -- weapons totally different from anything they had ever been trained to use. Not only did commanders and staffs have difficulty determining how they would employ the new weapons to their tactical advantage, but they also had to consider the effects of enemy gas on their own troops. By entering the conflict without preparation for chemical warfare, AEF commanders never fully comprehended the potential of gas on the battlefield."

**-- Leavenworth Papers No. 10,
Chemical Warfare in World War I:
the American Experience, 1917-1918.**

Operational planning focuses on ensuring successful mission execution. Planners, using the commander's intent, recommend priorities for support, allocation of force structure and other resources.

Strategic and operational estimates determine whether different courses of action can be sustained and the force's ability to regenerate combat potential. Planners also examine measures that can reduce the enemy's operational tempo.

Planners integrate NBC defense, nuclear weapons use, non-lethal, and smoke at theater, strategic and operational level as combat multipliers in support of mission accomplishment. For example, NBC defense unit availability increases the force's ability to sustain operations or to regenerate force capability under NBC conditions. The allocation of critical resources, such as large area smoke generation, supports the commander's intent to influence the battle in a given area which improves our force's combat power at a decisive point.

Tactical planning is a continuous process. Commanders and staffs incessantly assess how new information impacts current and future operations. Although unit planning is a continuous process linking current and future actions, this chapter discusses planning as a sequential process beginning with receipt of a mission order. Nonetheless, planning cannot be considered as a rigid process; each Commander and staff must adapt it to their needs.

BATTLE STAFF

A staff supports the commander with the resources needed to command and control his organization in battle. Together, they integrate the unit's capabilities into a single effort to defeat the enemy.

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Operations Orders or Plans	6-3

Each maneuver force echelon from corps down to company level has a chemical officer or noncommissioned officer (NCO) to integrate NBC operations (NBC defense, obscurant, and flame operations) into the combined arms fight. In most cases the chemical officer or NCO serves as a special staff officer. He is an integral part of the battle staff and plays a key role in development of tactical and operational plans.

The chemical officer or NCO works with all members of the battle staff. He has an especially close relationship with the G2/S2, G3/S3, FSCORD, and engineer staff officer to effectively incorporate NBC defense, smoke, flame, and non-lethal use considerations.

ESTIMATE PROCESS

NBC planning focuses on the chemical officer in two roles: as a member of a combined arms commander's battle staff and as a commander of a supporting chemical unit. Each role requires development of an estimate. During the combined arms estimate process a chemical staff officer integrates NBC operations into the planning process. During the chemical unit estimate the commander develops his plan to support his assigned mission.

Combined Arms Estimate

The commander's staff develops a plan using the five-part estimate process. The chemical staff participates fully with the rest of the staff in its development. FM 101-5 covers staff functions in detail; the following discussion covers the chemical battle staff's specific role in planning and his interaction with other staff members.

Mission

Planning for a particular operation begins with receipt of a warning order, OPORD, or OPLAN from higher headquarters. From it the commander and staff conduct a mission analysis. During this process the chemical staff integrates NBC operations into the OPORD/OPLAN. He conducts a vulnerability analysis and also assesses the force's readiness to operate under NBC conditions. When there is a specific NBC task (such as NBC recon of a main supply route or screening mission), he works with the G3/S3 to integrate it into the overall concept of operation.

The chemical staff assists other members of the staff in conducting a thorough situation analysis. They

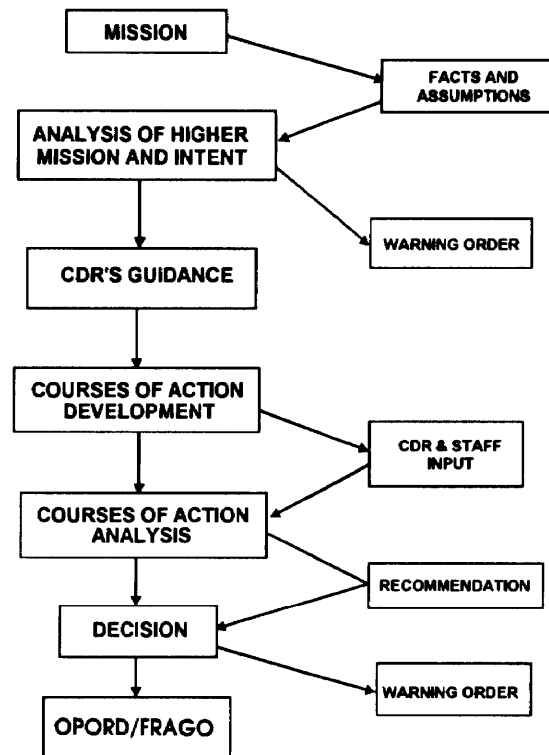


Figure 1.

concentrate on those aspects of the weather, terrain, enemy, and friendly forces that are significant from the standpoint of NBC defense, smoke, non-lethal, and flame operations.

The chemical staff coordinates with the G2/S2 to template enemy chemical targets in the area of operations. These templated chemical targets can be plotted either on a terrain or situation template. The G2/S2 analyzes weather, terrain, and enemy as part of IPB. The chemical staff uses the G2/S2s climatic data and weather forecast to identify factors critical to NBC use. They analyze terrain based upon how it impacts enemy nuclear or chemical weapons or obscurant use. They identify areas where deficiencies in natural cover and concealment maybe augmented by smoke. They locate water sources for decon sites and the road network requiring NBC recon. The G2/S2 provides the chemical staff with an estimate of the enemy's NBC delivery capability. Using this information the chemical staff conducts a vulnerability analysis. The G2/S2 also provides an estimate of the enemy's obscurant and flame capability. The staff works with the G2/S2 to develop the intelligence collection plan and recommends PIRs to confirm his estimate of the enemy NBC activity at key locations and times.

The chemical staff continues their situation analysis by reviewing the friendly situation including forces and resources available for the mission. The chemical staff also coordinates with the G1/S1 and the G4/S4 to assess whether various courses of action are supportable. When NBC operations will impact civilians, coordination with the G5 is necessary.

The chemical staff concludes its estimate of the situation with an analysis of the chemical units available to conduct decon, NBC recon, or smoke operations. The staff determines the status of units, their current operations, and completion times for ongoing activities.

The chemical staff provides the G3/S3 with a list of assumptions used in making the situation estimate. This action ensures that all staff estimates are based on the same parameters.

The G3/S3 has the lead in developing courses of action. The chemical staff develops a plan to support each course of action. For each one he identifies tasks and general priorities based on the commander's guidance.

Analysis of

Courses of Action

The G3/S3 has the lead in the analysis of each course of action. The chemical staff, along with the rest of the battle staff, assists the G3/S3 in wargaming each course of action against the anticipated enemy action or reaction. The chemical staff analyzes each course of action. They determine the NBC resources required for each course of action and recommend the best application of NBC defense, smoke, non-lethal, and flame operations. They identify advantages and disadvantages for each.

Shortfalls in chemical resources become apparent during the wargaming process. The chemical staff adjusts its plan to handle these. For every course of action the NBC defense and smoke plan must meet the commander's requirements. When appropriate, the FSCoord also develops nuclear fire plans to meet these requirements with input and/or recommendations from the chemical staff.

Comparison of

Courses of Action

The chemical staff compares the courses of action and selects the best one from their particular perspective. The staff provides that information to the G3/S3 for incorporation into the decision matrix.

Recommendation

The chemical staff provides assessments and recommendations to the commander during the decision briefing. The type and the amount of detail **the chemical staff briefs depend upon the needs and** preferences of the individual commander. In general, the briefing covers the following:

- Concept of chemical support.
- Chemical unit mission priorities.
- Critical NBC and smoke events/actions.
- Task organization and command/support relationships.
- NBC and smoke overlay (including smoke, NBC recon, and decon use, and concept for use).
- MOPP levels and where MOPP gear will be stored or carried.
- Critical tasks for subordinate units.
- Vulnerability analysis (including probable targets and agents).

Where appropriate the vulnerability analysis will also address the state of training and the ability of the soldier and unit to meet the shock and stress of an NBC attack. In World War I, chemical warfare resulted in many soldiers becoming nonbattle casualties because of battlefield shock and stress.

Other members of the battle staff also brief NBC information provided them by the chemical staff during the estimate process. This information can include, but is not limited to, NBC threat considerations, the commander's PIR, rules of engagement, or smoke in the deception plan.

Format

The chemical estimate follows the general format of other staff estimates (see FM 101-5 and FM 3-101). Because of time constraints in combat, it is seldom written below corps level, but this format should be followed at all echelons. The chemical staff develops an estimate that is as detailed as time permits. At battalion task force level, planning and executing an operation normally occur within a few hours. In contrast, corps-level planning typically occurs three to five days in advance. The estimate format provides the best assurance that the chemical staff has considered all essential information needed for a viable plan.

Chemical Unit Estimate

The chemical unit estimate follows the same format as the one done by the chemical staff on a commander's staff. However, the chemical unit commander and his staff develop a plan to accomplish

the mission assigned by the supported force or a higher chemical unit headquarters.

The commander of a chemical unit that supports another force commander coordinates closely with the chemical staff on that force's battle staff. The commander provides input for the development of the chemical estimate at that level and concurrently develops his own estimate for his own unit.

Mission

The chemical unit commander determines a restated mission for his unit based upon the assigned specific and implied tasks that his unit must do. All estimates, whether driven by the staff or the commander, are driven by mission.

Situation and

Courses of Action

Much of the situation analysis done by the chemical battle staff applies to the supporting chemical unit. The chemical unit commander develops courses of action for those elements of his unit still under his control. These courses of action support the course of action chosen by the force commander. His operational plans do not include subordinate units that are supporting other forces. However, he must still plan logistics support for elements placed OPCON to another unit.

Commanders of chemical units operating under the control of a higher chemical unit headquarters, instead of another force headquarters, develop and coordinate their own situation analysis with the controlling unit. They incorporate information from the staff of any appropriate headquarters within their area of operations into their estimate.

Analysis of

Courses of Action

The chemical unit commander identifies significant factors, wargames his courses of action, and lists the advantages and disadvantages for each of his courses of action.

Comparison of

Courses of Action

The chemical unit commander develops a decision matrix to choose the course of action that best accomplishes his unit's mission.

Decision

The chemical unit commander chooses the best course of action that will accomplish the mission.

OPERATIONS ORDERS

OR PLANS

Once the commander makes his decision on the course of action to follow, the estimate provides most of the information needed to write the OPORD or OPLAN. The order or plan conveys the decision to subordinate elements of the force in a clear and concise manner. The chemical staff assists the rest of the staff to produce the order or plan. His primary concerns are—

- **Task organization.** The heading of the order or a separate annex includes the task organization. The chemical staff lists the chemical units under the proper control headquarters and with the correct command or support relationships.
- **Intelligence.** The chemical staff coordinates with the G2/S2 to ensure that the PIR address the threat of enemy NBC weapons, smoke, non-lethal, and flame weapons. He also ensures that an adequate assessment is made of the enemy's intent and capability to conduct NBC operations.
- **Chemical concept.** Paragraph 3, Execution, has a "Concept" subparagraph that describes the commander's visualization of the operation from start to finish. This usually includes a brief concept for the use of chemical units.
- **Chemical unit subparagraph.** Paragraph 3 of the order includes taskings to subordinate units. The chemical unit subparagraph assigns NBC defense and smoke tasks identified throughout the estimate process.
- **Service support.** This paragraph includes required materiel services to support the chemical units and their missions. At division level and above it often appears in a separate annex.
- **Coordinating instructions.** This paragraph includes needed information, such as MOPP level, and operational exposure guidance.

Logistic planning

"...It was the gas at night that was the most wicked—being wakened out of a deep sleep, or even a half doze, by a muffled cry of 'Gas!' from one's comrad who was already struggling into his mask....In spite of casualties from gas and high explosive, the routine work of the sector went on, the consolidation of the front, and the arduous task of bringing up ammunition, supplies, water and food. The carrying parties that brought up the heavy and bulky boxes of caliber .30 and the great mermite cans of coffee or slum from the kitchens to the front lines, falling into shell holes in the darkness, stumbling over logs and slipping in the mud of the narrow paths in the woods, performing heroic labors."

**--Unit History of the 79th Division, 316th Infantry,
on the Division's activities in the First Army's**

Adequate logistics support is vital to any combat operation and must continue under all conditions. Sustainment under NBC conditions maybe even more difficult than other aspects of military operations.

When developing his plan, the commander balances requirements against limited resources. His challenge is to accomplish the mission with the assets given to him. Logistical considerations often drive the courses of action open to a commander.

SUSTAINMENT CHARACTERISTICS

Logisticians assist the commander in making the best use of available resources by following the sustainment characteristics of Army operations. They are anticipation, integration, continuity, responsiveness, and improvisation. These characteristics apply to operations under NBC conditions as well as to any other. Chemical staffs and units must understand and observe them while planning their operations.

Anticipation

Sustainment planners foresee future operations as accurately as possible and accumulate assets needed to accommodate any likely contingency. NBC defense and smoke operations feature high consumption rates of fuel, fog oil, decontaminants, water, and protective clothing. They require a commitment of logistical resources to sustain operations.

Integration

Tactical and operational plans must fully integrate logistic considerations. Include additional requirements for NBC defense, recon, smoke, and smoke into the overall plan. Protection of supplies and equipment is included. The effects of contamination on MSRs, supply points, and fixed sites are incorporated into overall planning.

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Continuity

Committed **forces** must continuously receive supplies and services to maintain fighting strength.

Operations under NBC conditions cause additional needs, such as more decontaminants or water.

Modify operational procedures to control/minimize contamination.

Responsiveness

The sustainment system must react rapidly to crises or fleeting opportunities. It must keep pace with the shifting of units around the battlefield. Awareness of battlefield NBC hazards also ensures needed logistic support is provided in uncontaminated areas.

Improvisation

CSS organizations must improvise to meet unforeseen emergencies. Degradation of CSS operations under NBC conditions will cause the need to alter work schedules because of **increased** times needed to handle contaminated supplies and equipment. Logistic planners may fabricate expedient covers and shelters to protect critical supplies from contamination. Logistics commanders will prioritize to accomplish mission-essential tasks.

When incorporating NBC considerations into the sustainment characteristics, it becomes apparent that the sustainment system must accomplish three complementary tasks: protect itself and sustainment resources in order to continue operations; provide the support needed by units operating under NBC conditions; and provide the support that chemical units need to accomplish their battlefield missions. Field expedient supply and equipment must also be considered due to limited and sometimes inadequate supplies of mission critical items.

SUPPORT FOR CHEMICAL UNITS

The manner in which the logistics system supports a particular chemical unit is based on a variety of factors. These factors include the unit's parent organization, its location in the theater of operations, and the command or support relationship under which it is operating. Chemical units must then develop this organization and relationship with all possible supporting units or higher headquarters.

Echelons

The CSS organization provides sustainment support to chemical units at each echelon as described below.

Army Service Component Command

The Army Service Component **Commander** (ASCC) is responsible for preparing, maintaining, training, equipping, administering, and supporting Army forces assigned to a unified command. Chemical units operating in the COMMZ will receive support from functional units (that is, logistics, personnel, transportation, medical, finance, and so forth) as required.

Corps

The COSCOM normally sustains corps chemical units, including corps units deployed in the division areas. COSCOM units habitually locate near the division rear boundary and in the division area itself; they provide responsive support to corps chemical units and **other units** that operate in the division rear. Corps chemical units sometimes operate too far forward in the division area for COSCOM units to render effective support. In this case, the chemical unit must coordinate support requirements through its parent unit, with COSCOM units and the division support command (DISCOM).

Division

The DISCOM sustains the division's chemical units. The division and corps G4s coordinate required augmentation.

Brigade

The DISCOM provides CSS elements in the brigade support area (BSA) to sustain the brigade. Chemical unit assets in the brigade area may receive support through the BSA **or** from the parent chemical unit. The brigade chemical officer, working with the S4, coordinates brigade support if required.

Battle Command Considerations

The command or support relationship under which the chemical unit operates establishes responsibility for its support. **However, this** must be clearly stated during the planning phase of an operation.

A chemical unit in direct or general support of **another** unit depends upon its parent organization for

sustainment. Prior coordination can alter this to fit the situation. For example, an ASCC chemical unit performing a task in the corps area could receive support from the COSCOM instead of the ASCC.

SUPPORT FOR CHEMICAL MISSION

A chemical unit under the OPCON of another unit continues to receive support from its parent organization, but the supported unit could provide some assistance through prior coordination. For example, a chemical company in an OPCON relationship could receive rations or POL from the unit they are supporting. OPCON relieves the maneuver commander of formal responsibility for chemical unit sustainment. However, frequently it is simpler for him to provide common classes of supply (for example, fuel and rations). Logistics planners coordinate and ensure that the CSS structure is in position to make this a viable option.

A chemical unit attached to another unit receives its support from that unit. This **support usually requires** detailed coordination by the logistics planners; they must **ensure** that the chemical unit receives repair parts and other maintenance support needed to keep it operational. Relevant OPLANs define support relationships for nonroutine support.

Logistics support for NBC readiness involves two levels of concentration. The first is CSS for NBC defense of all units. This is the supply and transportation of adequate stocks of chemical defense equipment to support the operation. The second is sustainment of chemical units--smoke, decon, and recon organizations. At both levels, support for the chemical mission involves analysis of maneuver force responsibility, tactical considerations, and staff coordination.

Maneuver Force Responsibility

A chemical unit attached to a maneuver force identifies the resources needed to accomplish the mission; it passes that requirement to the maneuver staff S4/G4. The S4/G4 then coordinates with the supporting CSS elements to fill the requirement.

The materials and transportation needed for chemical missions often compete with the requirements of other units. The maneuver staff satisfies competing demands based upon the commander's priorities. The resource-intensive nature of NBC defense and smoke

operations must be a key consideration for the staff in resolving those demands.

Tactical Considerations

CSS elements must deliver materiel as far forward as possible. This delivery enables chemical units to minimize the time spent on trips to the rear to load and transport materiel forward in their own vehicles. This minimization is particularly critical for chemical units operating in the forward brigade areas. CSS operators assist this minimization by transporting material to the forward supply points.

A chemical unit basic load enables them to start their mission without waiting to pick up supplies; however, the basic load may not be sufficient for the entire mission. Chemical units must be able to task organize their forces to execute missions specified in the OPORD. For example, decon platoons maybe involved with resupply of smoke platoons if smoke operations are the priority effort. Logistics planners start pushing supplies (for example, fog oil) forward as soon as they identify a requirement, even if the exact quantities are not immediately known. That way, the supplies begin to arrive before the unit exhausts its basic load.

The rapid pace of combat operations may consume materiel faster than the ground transportation system can replenish them. For that reason chemical units may occasionally need support by aviation assets to deliver critical materiel directly to using units.

Staff Planning, Coordination, and Supervision

The chemical staff planner's involvement in sustainment operations begins with an order from higher headquarters. The chemical staff planner prepares a staff estimate for the chemical unit(s), providing prioritized input into the order and to the G4/S4. The logistical channels such as G4/S4, DISCOM, and BSA start their planning, coordinating, and pushing supplies forward.

Once the basic planning is done, the chemical staff officer coordinates with the logistics section to ensure operational needs will be met. Some items may be command regulated and require release from the higher headquarters. Changes in mission often require a shift in the priority given to certain units or for particular items of equipment.

As units execute the plan, the chemical staff coordinates with the logistics staff element to track the logistical status of both units and missions. In

particular, they assist as needed to solve problems of supply or delivery that threaten the successful completion of critical tasks. Combat losses and breakdowns of key equipment continuously force adjustments to the original plan.

COMBAT SERVICE SUPPORT OPERATIONS

Personnel and logistics units will sustain, man, arm, fuel, fix, move, **and protect our force. They sustain our soldiers, enabling them to continue to fight under NBC conditions.** CSS operations are crucial for ensuring retaliatory, NBC battlefield management, and force protection actions are accomplished successfully.

Managing Battlefield Operations Under NBC Conditions

Support control elements will assist in informing all personnel of contamination hazards.

Two of the four primary military police missions—battlefield circulation control (BCC) and area security—are essential to support missions under NBC conditions. BCC involves route recon and/or surveillance, MSR regulation, straggler and refugee control, and information dissemination on NBC warnings or reports. Area security involves area recon, NBC detecting and reporting, and area damage control.

Highway regulating point teams from the movement control element will use NBC and intelligence reports to monitor contaminated routes and regulate traffic on MSRs. As necessary, they will recommend diverting supply convoys to alternate routes. Coordination is made using the services of the Joint Movement Control Center (JMCC).

With prior coordination logistics units may provide or assist resources for smoke, decon, and recon units. Operations on an NBC battlefield may require increased fuel because of the increased time to conduct battlefield movement in MOPP. Additionally, supply companies will issue fog oil. Chemical units that require large amounts of fog oil may request transportation assets to deliver the fog oil to a designated site. However, higher priority movements, such as fuel or ammunition, may delay movement of fog oil.

Protecting Forces From NBC Hazards

Support units cover equipment and supplies to protect them from NBC contamination. Outerwraps and containers help to protect truck cargo and reduce the spread of contamination. While surface transport can cross contaminated areas, the situation may require that critical supplies (rations, emergency medical equipment and supplies, ammunition, and fuel) be flown over contaminated areas. The G3 will make the decision based on METT-T and the commander's intent.

Support elements will aid in returning NBC casualties to duty. Cargo vehicles used to deliver supplies to forward supply points can be used to evacuate casualties to medical treatment facilities. In an emergency, **cargo** trucks can be used to transport soldiers from targeted areas to safe areas. As required, transportation assets will be used to move replacement personnel and to return soldiers to their parent unit. Transportation assets may also be used to move personnel and equipment to reconstitution sites in the rear area.

Support from logistics units enables forces to continue their mission performance for extended periods under NBC conditions. Specifically—
• Class II points operated by supply units will issue protective masks and overgarments as well as protective shelters to help prevent or limit casualties from NBC warfare. Supply units will normally package protective clothing as complete sets of MOPP equipment to support a predetermined number of soldiers. Decon supplies may be issued in preconfigured “push” packages.

- Field services units will provide laundry, shower, and clothing repair service to supported units.
- Water supply units will purify NBC contaminated water for use as potable drinking water and provide nonpotable water for decon of personnel and unit equipment. Water purification operations, however, will not occur in areas where vapor or liquid agent contamination hazards are present. Units must use their organic equipment to transport water.
- Contaminated remains will be recovered and decontaminated for return to CONUS.

The decision to reconstitute a unit will be made at corps or EAC level. The large-scale infusion of personnel, equipment, and supplies involved in reconstitution is approved and controlled at the level that has the resources to perform reconstitution.

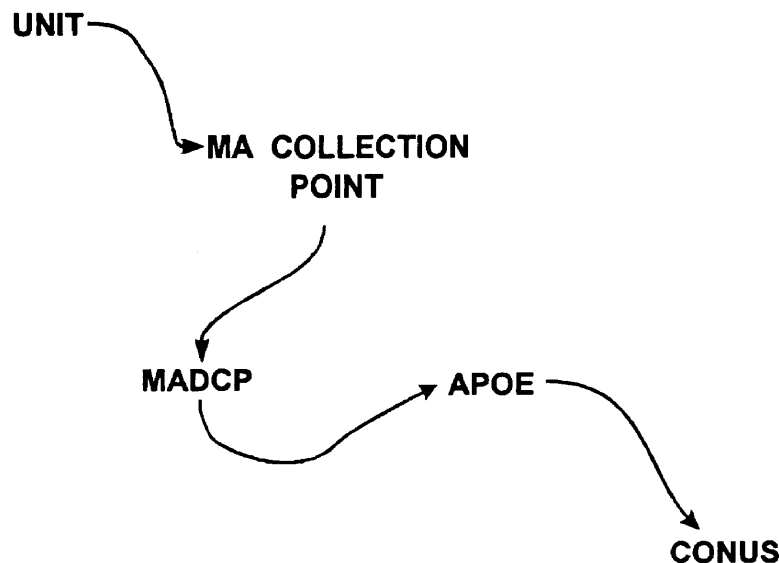


Figure 8-1. Flow of contaminated remains in the theater.

Normally, units will withdraw to a reconstitution site in the rear area that is safe from enemy interdiction and harassment. Theater-level assets will be used to return the units to combat-ready or mission-ready status. Personnel replacements will come from the replacement system, medical returns, and redistribution assets.

The surface transport system will continue to move fuel, ammunition, rations, and medical supplies as far forward as possible to supply distribution points. As necessary, trucks will throughput critical supplies to forward supply points.

Mortuary Affairs Decontamination

The Army Component Commander, in coordination with the Joint Mortuary Affairs Officer, will establish the necessary task force to support a mortuary affair decon collection point (MADCP) (Figure 8-1). The MADCP will be task organized with a mortuary affairs unit and decon unit. The size and scope of the MADCP is dependent on the threat and tactical situation. Much of the necessary equipment to operate the MADCP is located in operational project stock (OPS) in CONUS and will be deployed to the theater of operations as necessary.

Chemical personnel at the MADCP will provide general decon support and technical assistance. FM 10-63, *Handling of Deceased Personnel in Theaters of Operation*, and the annex to JP 4-06, Joint Tactics, Techniques and Procedures for Mortuary Affairs in Joint Operations provide detailed information on the set-up and operation of the MADCP (Figure 8-2).

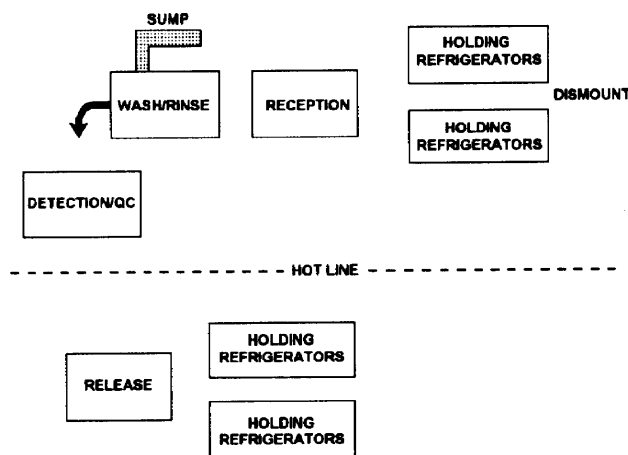


Figure 8-2. Layout of the MADCP.

Part Four
Operations
Chapter 9

Force Projection Operations

"My nightmare was that our units would reach the barriers in the very first hours of the attack, be unable to get through, and then be hit with a chemical barrage. We'd equipped our troops with protective gear and trained them to fight through a chemical attack, but there was always the danger that they'd end up milling around in confusion — or worse, that they'd panic. The United States had not fought in a gas attack since World War I. The possibility of mass casualties from chemical weapons was the main reason we had sixty-three hospitals, two hospital ships, and eighteen thousand beds in the war zone."

**General H. Norman Schwarzkopf
CINC CENTOM during Operation
Desert Shield/Storm, 1991**

Force projection is key to power projection and central to our national security strategy. Combatant commanders will attempt to resolve crises within their AORs with forward-presence forces. If forces are insufficient to meet the crisis, it will be necessary to project forces from CONUS or another theater.

Force projection may be deliberate or time sensitive. The Army's response to a regional crisis may be time sensitive and may occur in areas of the world where the Army does not have a significant presence. With the proliferation of weapons of mass destruction, it could be that regional crises will involve nations which have an offensive NBC capability. As NBC weapons will make any operation more difficult, detailed planning is crucial. Chemical units and staffs must be prepared to operate across the range of military operations will play an increasing role in force projection operations.

Early entry forces are those operational deploying forces required to support the Commander in Chief's (CINC) or other Joint Force Commander's (JFC) concept of operations in a pre-crisis or crisis situation. Early entry forces must possess capabilities to deploy rapidly, enter the operational area, secure

the lodgment, and either immediately have decisive effect or create conditions for the arrival of substantial follow on forces that then conduct decisive operations. Early entry forces must consist of lethal and survivable units tailored to support or carry out the operational intent of the JFC. Chemical staffs and units will be integral parts of early entry forces.

In addition, force projection operations involving US forces may involve response to operations other than war, such as peacetime contingency, peacekeeping, insurgency/counterinsurgency, or terrorist incidents. The commander's PIRs include focus on enemy, insurgent, or terrorist capability to use chemical or biological weapons. Feedback supports the commander's decisions on MOPP and/or decisions on chemical unit deployment. A critical element of combat power, maintaining force protection, is crucial in these situations. Austerity will characterize our operations; unneeded losses can be offset by

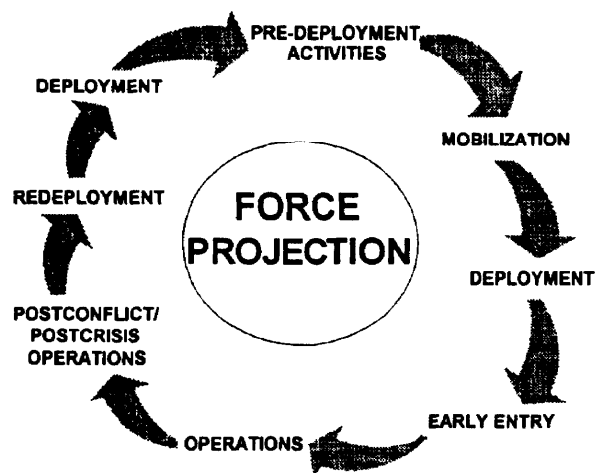
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realistic training based on our mission-essential task lists or by taking needed actions to neutralize an enemy's capability.

FORCE-PROJECTION OPERATIONS

This section describes early entry in the context of the first five phases of force projection operations: mobilization (if necessary), pre-deployment activities, deployment, entry operations, operations, postconflict/postcrisis operations, redeployment, and demobilization. These stages occur whenever missions require the projection of US forces from CONUS or elsewhere. Force projection operations often overlap in space and time and are not distinct, requiring commanders and units to deal with them simultaneously and/or sequentially. Force projection operations seldom begin with a clear identification of what the entire force package will be, or even with the ultimate purpose clearly in focus. Nonetheless, it helps to conceptualize a logical flow from phase to phase, as long as the force remains physically and mentally prepared to adjust as the operation evolves.



Pre-Deployment Activities

Following receipt of a mission requiring projection of US forces, commanders must conduct mission analysis and force preparation. During this phase, military forces are selected and a force is tailored for deployment to meet the needs of the crisis. The type of crisis will dictate if chemical staffs and units are involved. Intelligence concerning the threat's capability to use NBC or the type of commercial

chemical hazards in the area of operations is critical to properly tailor the force.

Selected **chemical units are alerted. Units recall and assemble personnel, upload equipment and prepare for movement to the marshaling area.** The amount of time the unit has available may be limited. Thus, premobilization training and preparation is critical. Units must review their load plans and deployment plans to ensure that all mission-essential equipment deploys with the unit. Review mission essential task list (METL) and develop a training program to correct identified deficiencies as time permits.

Peacetime planning, combined and joint training opportunities, and pre-positioning of chemical materials and equipment improve our preparedness for NBC and smoke operations. Contingency plans must include host nation support (HNS) to substitute for chemical forces not available in the early phases of an operation.

Mobilization

Crisis response may consist primarily of active Army early entry forces. Developing METT-T may require the mobilization of resources to handle unique situations and requirements resulting from the crisis. Mobilization may include activating all or part of the Reserve Components as well as assembling and organizing personnel, supplies and materiel. A significant portion of the Chemical Corps force structure is maintained in the Reserve Component. To maintain quick response time, select Reserve elements may require higher levels of deployment readiness.

The amount and type of reserve forces mobilized depends on the crisis. This includes assisting in organizing personnel, material, and supplies and certifying the proficiency of individuals and units.

Deployment

During this phase of the operation the force actually deploys to the area of operations. Carefully tailoring early entry forces to the situation at hand requires consideration of METT-T, available strategic lift, the capabilities of the joint, combined and host nation forces, and facilities in theater. During peacetime, deployment will normally be to the host nation directly by air or sea movement. In operations conducted during hostilities, or war, occupation and expansion of the lodgement areas may require a forced entry and immediate combat operations. If the threat has the capability of using NBC weapons, the use of these weapons during this phase may provide

him with the greatest payoff against US forces. Combat forces and supporting forces will be sequenced into the area of operations to gain and sustain the initiative while protecting the force.

A tailored chemical force consisting of smoke/decon and NBC recon elements should be considered for early deployment if the threat warrants. If the threat has no offensive NBC capability, smoke/decon units could deploy without their decon equipment to minimize transportation requirements. When deploying elements include units such as light infantry divisions, they require chemical unit augmentation from corps assets.

Entry Operations

The requirements for entry operations following deployment will vary with each operation. Unopposed entry is favored. Here deploying units flow through air or sea ports into lodgement areas. Typically entry operations during operations other than war will be unopposed. An opposed entry would require combat in order to land the deploying forces in the theater. The vulnerability of entry forces to weapons of mass destruction are acute during the initial entry stage. Force protection is critical. Chemical staffs and units will play a key role in providing force protection.

The objective during this phase is to rapidly build the capability of the force in the area of operations. Proper sequencing of forces into the area will contribute to the stabilization of the situation and allow the commander to conduct decisive operations as early as possible. Combat may or may not occur. In either case the emphasis is on developing the preconditions for executing decisive operations.

Principal tasks during this phase include--establishing a forward operating base, closing the force, expanding the lodgement, linking up with other forces, securing the lodgement by expanding the security area, and striking out to engage enemy forces in offensive operations. If the enemy has NBC weapons, a minimal decon capability needs to be available. Smoke elements provide force protection with large-area smoke.

Protection of the force is primary. Early entry forces must protect themselves from numerous threats to include biological/chemical attack, tactical ballistic missiles (TBMs), and terrorism. Smoke units can provide large area screens over vital areas or as part of a deception operation. NBC recon units are positioned to react to any report of NBC hazards or attacks. Decon units are prepared to rapidly

decontaminate contaminated units or facilities. Terrain decon of vital areas, such as ports or air field may be necessary.

Unopposed Entry

When No Combat

is Taking Place

In this situation the intent of early entry force maybe to serve as a deterrent, to act as the advanced detachment for a much larger deployment that will follow, or to participate in non-combat operations such as disaster relief or humanitarian assistance. The composition of the early entry force will depend on a careful mission, enemy, terrain, troops, and time available (METT-T) analysis prior to deployment sequencing. In some cases, though combat is not expected, the composition of the early entry force should include smoke generator elements and non-lethal systems to enhance force protection.

Unopposed Entry

Under

Combat Conditions

In this case the early entry force is deploying units into the area of operations where combat is underway, or imminent, but ports and airfields are under friendly control. The composition of the early entry force may vary widely depending on the situation. For example, if the Host Nation armed forces are on the verge of being overwhelmed, US early entry forces may include maneuver units that can control terrain and prevent the enemy from seizing ports of debarkation. However, if the Host Nation's armed forces are conducting effective resistance but lack deep attack capabilities such as sensors and attack systems, early entry forces may require tailoring to satisfy that need. Each situation is different and will require force tailoring based on METT-T considerations. A chemical force package consisting of NBC recon, biological detection, and decon should deploy when there is a threat from weapons of mass destruction. The deployment of smoke elements must be considered for their force protection value.

Forcible Entry

Forcible entry is the riskiest type of early entry. The early entry force is designed to either—

- Secure a lodgement for the subsequent arrival of larger forces that will conduct decisive operations or
- Immediately have decisive effect by collapsing the

enemy's center of gravity and accomplishing the mission.

In either case, the early entry force will consist predominately of maneuver units.

Secure the

Initial Lodgement Area

Early entry forces must be **prepared for simultaneous** deployment and use. This will require that, at a minimum, they have the capability to seize and control the lodgement, develop the theater and, to the extent possible, establish the preconditions for decisive operations. In a combat situation early entry forces may initially be outnumbered, requiring them to task organize and echelon to arrive in the area of operation in a sequence appropriate to the combat situation. Joint NBC defense operations will be critical. There will not be sufficient NBC defense resources to meet the needs of all deploying forces, regardless of Service. The objective during the early entry phase is to quickly integrate all elements of combat power and to disrupt or destroy the enemy force ensuring survivability of the early entry force and promoting success of the overall operations.

In the event combat has not begun, entry may entail gaining positional and/or political advantage or building up overwhelming force to deter a potential aggressor. Even if the strategic intent is to deter an opponent, the operational focus must be on seizing the initiative and creating an offensive capability to fight and win should deterrence fail.

Deploying chemical units focus on immediate support for NBC needs and the subsequent expansion of this support. Combat operations can coincide with development of the theater, so chemical forces organize to support combat and buildup requirements simultaneously. For example, the situation could require commitment of both division and corps chemical units early in the deployment sequence to conceal engineer construction of an assault airstrip and to decontaminate a port. At the same time, chemical units may be required to support the reduction of enemy chemical obstacles.

Operations

Under many circumstances, early entry operations conclude prior to the conduct of decisive operations. However, early entry forces could engage in decisive operations immediately to accomplish the mission, in effect conducting a coup de main. The operations are intended to produce an immediate, decisive effect. In

these circumstances, early entry forces seek to rapidly collapse the enemy's center of gravity, then achieving the desired end-state of the operation simultaneously with deployment of forces. They will include predominantly combat forces with only a relatively limited sustainment capability. These operations **require** extensive planning and rehearsing.

During this phase, the commander synchronizes elements of power to Successfully conclude the contingency. In operations involving combat, chemical units and staffs will perform their normal combat support roles. In peacetime engagement, the force completes its mission. If the enemy has an offensive NBC capability, it will likely be used during this phase. Chemical units establish themselves in the theater. Early deployed chemical elements will support combat forces with smoke, decon, NBC staff, and NBC recon support as necessary. Decon sites will be identified and prepared. If time permits, conduct training to correct any deficiencies.

Postconflict/Postcrisis Operations

The objective in this phase is to identify post-crisis and post-conflict requirements as early as possible. Units and assets no longer required are redeployed. Depending on the NBC situation, chemical units may be required to remain in the area of operations longer than other forces.

Chemical units may remain in the area of operations to identify areas of contamination, locate NBC weapon storage sites, provide decon support, or perform other tasks and missions. A command and control element needs to be present until all chemical units have redeployed. Once the units have redeployed, they must quickly prepare for possible future missions in other theaters or areas of operations.

Redeployment

During this stage, units that are no longer required are redeployed. Chemical assets may be required to remain in the area of operations to provide support. Captured NBC weapons and NBC defense equipment must be properly handled and disposed. Decon units may be required to perform thorough decon operations to allow for the retrograde of equipment contaminated during operations. Peacetime and wartime acceptable exposure levels vary and federal laws must be followed. Chemical units will assist in the redeployment by establishing and supervising

wash racks to clean vehicles and equipment before loading onto ships and aircraft.

Demobilization

Reserve component units are returned to reserve status. The demobilization of NBC logistical material and supplies is also part of this operation. During this phase, units must conduct after action reviews and prepare written summaries of their observations. By documenting what went right and what went wrong, lessons learned can be developed.

FORCE PROJECTION

CONSIDERATIONS

Force projection operations will challenge chemical staffs and units. To set the conditions for a successful mission accomplishment, commander's must make decisions early. These key considerations apply.

Force Protection

The commander must balance lethality against supporting forces. If the commander chooses only to project lethal forces early, he may create a window of vulnerability to allow the enemy to use weapons of mass destruction.

Duration

The type of crisis will determine the duration of the operation. Chemical units and staffs must be prepared for sustained operations. Supply and maintenance support requirements must be included in the initial planning stages.

Forces are most vulnerable and the success of the contingency operation at the greatest risk during initial entry. This vulnerability is acute when the enemy possesses weapons of mass destruction. Protecting the force will be critical to the success of this phase of the operations because of extreme vulnerability.

FM 100-5, Operations, 1993

Force Tailoring

Force tailoring configures forces for the mission. The force must be appropriate and based on METT-T, lift capability, pre-positioned assets, and host nation support. Contingency operations require forces tailored for the specific crisis. The type of force and the NBC threat will dictate the required chemical support.

Task Organization

Task organization is the process of forming task forces. The composition is determined by the situation and the available transportation assets.

Chemical company teams may be formed to provide the necessary chemical support with a controlling headquarters.

Intelligence

Accurate, timely, and detailed intelligence is critical during contingency operations. Chemical staffs must determine the enemy's offensive NBC capability. Additionally, potential commercial NBC hazards should be assessed.

Logistics

NBC defense equipment places a great burden on the logistics system. Chemical staff officers must advise the commander when to initiate MOPP along with a risk assessment. Coordinate logistics support for the chemical units in the area of operations.

Battle Command

Chemical command and control elements deploy early during the operation. They can lessen the burden on the chemical staffs. Chemical command and control elements are allocated based on the number and type of subordinate elements. A chemical company headquarters is allocated if two or more chemical platoons deploy. A chemical battalion HHD deploys if there are two or more nondivisional chemical companies in the force. A brigade chemical HHC deploys if there are two or more chemical battalions in the force.

Offensive Operations

"The initial hesitancy by the AEF to employ gas was judged understandable by an officer of the 1st Gas Regiment The American Army was unprepared to engage in gas warfare when President Wilson committed it to battle. As a result, the use of chemical weapons and the defense against them became a deadly learning process for all branches of the Army under the stress of battle."

**--Leavenworth Papers No. 10,
Chemical Warfare in World War I:
The American Experience, 1917 - 1918,
1984.**

purpose of the offense is to defeat, destroy, or neutralize the enemy force. Because tactical offensive operations often expose the attacker, they normally require local superior combat power at the point of the attack. Massing of combat power can create a window of vulnerability to enemy WMD.

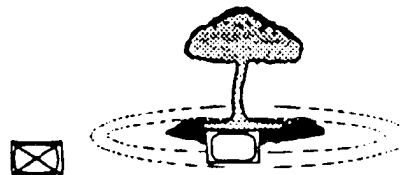


Initial nuclear effects on a massed unit

CHARACTERISTICS OF THE OFFENSE

Surprise

By achieving surprise, the enemy's opportunity to use WMD are reduced. The proliferation of modern surveillance device makes achieving outright surprise more difficult. Use of obscurants can assist the commander in achieving tactical surprise. Visual and infrared obscurants can defeat or hamper many battlefield surveillance and targeting systems.



Initial nuclear effects on a dispersed unit

Concentration

While surprise may contribute to offensive success, concentration is the ability to mass effects without large formations. Concentration of any size force is a vulnerability that the enemy can exploit with WMD. Forces must be dispersed and then concentrated for the attack. Dispersed forces are not lucrative targets for attack by WMD.

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Tempo

Tempo is the rate of speed of military actions. Controlling or altering rate is essential for maintaining the initiative. Enemy WMD can alter the tempo and allow him to seize the initiative. Smoke can also affect the tempo of military operations. Use of NBC recon elements to avoid contamination can mitigate the effect on tempo.

Audacity

Audacity is a key component of any successful offensive plan. Integration of NBC defense, chemical unit support, and smoke all contribute to the execution of audacious operations. Commanders must understand where and when they are taking risks on the NBC battlefield and their chemical staffs will assist them in understanding the risks.

OPERATIONS IN DEPTH

Offensive operations are conducted throughout the depth of the battlefield. Commanders arrange the battlefield into three closely related activities — deep, close, and rear operations. Under NBC conditions, the attacking force commander uses NBC defensive principles — avoidance, protection, and decon — to preserve his force. He plans for the use of friendly smoke and for countermeasures to enemy use of obscurants. He defends his force against enemy flame weapons. If national command authorities authorize release, the commander incorporates nuclear fires into their offensive plans.

commanders integrate NBC defense, smoke, flame, and recon elements throughout this framework. When authorized, nuclear attacks support close and deep operations. These fires destroy or contaminate defensive positions and cause casualties. Nuclear attacks may also contaminate deep terrain to restrict or canalize the defender's movement.

Recon elements of the attacking force detect contamination along the routes of advance. Attacking forces bypass or adopt protection to cross this contamination. Forward forces breach obstacles under the concealment of obscurants. These obstacles may include chemical and flame weapons. If attacking forces become contaminated, they continue the attack in MOPP4.

Under the threat of enemy NBC use the attacking force commander conducts his approach with dispersed forces. This dispersion limits possible damage by an enemy NBC attack. However,

dispersion also limits immediately available combat power. Attacking forces must quickly mass to assault the objective. The attacking commander uses obscurants to conceal his disposition and intentions.

NBC recon elements in the rear area monitor lines of communication. If they find contamination, they search for clean, alternative routes. Logistics activities move forward using these routes during limited visibility or under the concealment of smoke.

FOCUS OF NBC

CONSIDERATIONS IN THE OFFENSE

The key to success in an offensive campaign lies in defeating the enemy before the offense reaches its culmination. Culmination occurs because the attacker consumes resources and commits forces through successive battles. Eventually the attacker no longer has the combat power to sustain its momentum. Under chemical or biological conditions culmination may come earlier than in a conventional offense. Successful attacks may require more people and more time. Attacking forces require more fire support. Personnel in MOPP become exhausted more rapidly. These factors drain an attacker's resources and slow its momentum. The focus of friendly NBC considerations is to conserve combat power in the attack, so the attacking force can defeat the enemy before reaching its culminating point.

Characteristics of NBC Weapons

NBC weapons share the following characteristics that drive offensive and defensive actions—

- Mass casualties.
- Large-area coverage.
- Persistent hazard.
- Slow operations.
- Complementary effects.

NBC weapons cause mass casualties over large areas. For example, the single atomic bomb dropped on Hiroshima caused 144,000 casualties. The first chemical attack at Ypres in World War I resulted in 15,000 casualties. More recently, Iran reported 13,358 chemical casualties from January through March 1988 alone in their ten-year war with Iraq. Nuclear radiation, biological agents, and chemical agents can reach targets hidden from conventional weapons. For example, nuclear radiation can penetrate armored vehicles. chemical agents can seep through cracks and openings in vehicles and

structures. Neither side can predict areas of contamination with complete assurance; effects of weather and terrain vary contamination patterns.

NBC weapons may remain effective long after they have been used. The length of time they produce casualties can be controlled to some extent by the user. Chemical and biological agents are particularly useful in this way. Commanders can select agents whose casualty-producing effects last for a few moments or a few weeks. Nuclear weapons can produce short-term blast, heat, and initial radiation. With a surface burst radioactive fallout will form a long-term hazard.

NBC defensive measures will slow operations. The threat or use of many NBC weapons may force an army to take time-consuming protective measures. Troops disperse to reduce the effects of an attack. They practice a high degree of personal hygiene to prevent infection. This may increase logistics requirements. NBC recon will consume resources, especially time. In addition, personnel in protective gear find it more difficult to work or fight. Protective measures degrade combat power. The use of PSYOP can assist in the avoidance of NBC attacks by targeting both the enemy decision makers and public opinion with the objective of preventing NBC attacks.

Nuclear, chemical, and conventional weapons complement each other; using them together increases total effects. For example, using smoke to conceal visual indicators of a chemical attack increases casualties. Using chemical weapons against forces on the edge of a nuclear attack increases the effects manifold.

NBC Considerations

During the Offense

The defending force commander will plan to disrupt the attacker's command and control. He may use NBC weapons to cause casualties and contaminate equipment and/or terrain, thus degrading the attacker's combat power. The attacking force commander preserves synchronization and the strength of his force through the fundamentals of NBC defense.

Avoidance

The key fundamental of all NBC defense activities is to avoid NBC attacks and their effects whenever possible. Avoidance includes passive and active avoidance measures.

Passive

Avoidance

Measures

Commanders ensure operations, communications, and electronic security. Leaders prepare their soldiers to survive and operate under NBC conditions. Offensive forces use natural concealment, camouflage, and smoke. They conduct deception operations, using feints, demonstrations, dummy equipment, and manipulated electronic signature. Commanders continuously analyze present and planned dispositions for NBC vulnerability. They actively seek available intelligence on the specific NBC threat.

Active

Avoidance

Measures

Active measures are those NBC defense measures that reduce the likelihood of exposure to NBC hazards and the impact of those hazards. These measures include:

Detecting contamination. Attacking force recon and security elements check for contamination. Each unit uses its organic capability to check its route, zone, or area. If nuclear weapons have been used, units conduct continuous radiological monitoring. Advance parties of displacing units use chemical and radiological detection equipment to check primary and alternate positions for hazards. Positive identification of hazards supports the commander's analysis of the situation.

Marking contamination. Forward elements mark all likely entry points into a contaminated area so follow-on forces can avoid the contamination. Where appropriate, forward elements may leave a guide to assist successive echelons through the contamination. Commanders must train their forces to recognize enemy contamination markers.

Passing alarms and signals. The enemy situation dictates the type of alarm to be used. Visual or vocal alarms will be most often used. Where appropriate, units may pass the alarm over the radio. However, they must consider communications security so that they do not prematurely reveal their location.

Warning and reporting. Units report NBC hazards to the controlling headquarters. The headquarters further disseminates reports as necessary. It also disseminates nuclear and chemical attack warnings to affected units.

Limiting contamination. Bypassing is the preferred method of limiting contamination. However, when a unit must cross contamination, it carries as much equipment as possible inside its vehicles. Critical items left outside are covered or left in containers wherever possible. When a unit crosses a contaminated area, it avoids vegetation, such as small trees, brush, and tall grass. The faster it crosses, the shorter the hazard contact time.

Protection

Avoidance and protection are closely linked. Many avoidance techniques also provide some measure of protection against NBC weapons effects. However, the attacking force commander can take several specific measures to improve survivability of the force.

Hardening Positions

and

Readying Personnel

Most attacking forces will be moving and will be unable to construct hardened positions. These forces continuously locate potential shelters while moving and schedule stops near them. These shelters include overpasses, tunnels, culverts, and built-up areas. Forces displacing from position to position, such as artillery or combat service support, search for locations that provide blast or radiation protection. Personnel prepare for a nuclear or chemical strike at any time. Troops keep sleeves rolled down and wear headgear (helmets, communications equipment, and patrol caps) when possible. They wear earplugs or headsets to provide protection from eardrum rupture or hearing loss. Personnel fix detector paper to their vehicles according to their SOPS for early signs of chemical attack.

Assuming MOPP

Leaders use standardized MOPP levels to increase or decrease their unit's level of protection. Because the levels are standardized and all soldiers understand them, leaders can order changes in protection without long explanation. They may place elements in differing MOPP levels or authorize variations within a given level. In particular, on the move advance forces and recon elements may maintain a higher MOPP level than following forces. The leader whose immediate subordinates are directly exposed to chemical hazards needs to be the one who directs whether his personnel should go into or come out of

MOPP levels 3 and 4. Once the force has been subjected to NBC hazards, individual leaders must limit the MOPP degradation of their force. Leaders will determine the hazard, take needed actions, and make decisions on whether to order unmasking, relocation, decon, and so forth.

Leaders must consider the degradation experienced in MOPP. Command and control suffer under MOPP conditions due to exhaustion of leaders, behavioral changes, and increased periods when no one is in charge. Communications are less effective because of the mask, so plans are more difficult to change. A unit in MOPP4 tends to rely heavily on indirect fires. Additional calls for fire make it more vulnerable to enemy interception and direction finding. As a general rule it takes almost twice as long and twice as many people to conduct a successful attack in MOPP4. Training and acclimation increase the ability of the individual soldier and unit to operate in MOPP.

Reacting to

NBC Attacks

The defending force may use NBC strikes to weaken the attack. The defender will attempt to cause casualties. It will try to separate the attacking forces and prevent their reinforcing each other. It will try to disrupt the momentum of the attack.

The attacker must continue its operations with a minimum of disruption. Attacking forces take immediate action in response to a nuclear or chemical strike. Following initial actions the attacker must maintain the initiative. Soldiers and units react using their battle drills to ensure successful mission accomplishment. Commanders must continually update their plans to solve trafficability problems. Residual effects of a nuclear weapon include tree blowdown, tires, and rubble. Contamination from chemical strikes restricts mobility. Attacking forces may need to wear MOPP4 until the mission is completed.

Decontamination

When avoidance is not possible, personnel adopt protection. However, that protection decreases combat power. Soldiers cannot see as well and cannot acquire and kill targets as efficiently. Mobility is reduced. Heat builds up in the MOPP suit. Troops experience physical and psychological stress. As the troops remain in MOPP, protection begins to break down. Heat, stress, and chemical casualties occur. The longer a unit stays

contaminated, the greater its chances of sustaining casualties.

The commander of the attacking force must use METT-T to recognize how contamination will affect the culminating point. If the culminating point will occur unacceptably early, he plans for decon according to the principles of speed, need, limit, and priority. Decon of units in the attack is normally not conducted until consolidation on the objective.

Speed. The attacking force decontaminates as soon as possible. At a minimum, soldiers conduct the immediate decon required for survival. When enemy contact is not imminent, operational decon allows temporary relief from MOPP4. It also speeds up weathering of the agent. Conducting operational decon lessens spread of contamination.

Need. The attacking force decontaminates only what is needed for its immediate mission. However, the attacking force commander must take great care not to underestimate his needs. An offensive action in MOPP4 may need more resources and more time than a similar action under conventional conditions.

Limit. The force commander decides whether to move contaminated vehicles and equipment. Where possible, he conducts decon near the site of the original attack to limit the spread of contamination. If this is not possible, the unit segregates contaminated items from clean items.

Priority. The force commander prioritizes his decon efforts according to the importance of the contaminated items to his mission. Typically, he gives highest priority to critical weapon systems in the main attack. He may also give high priority to special requirements for the offense, such as air defense.

PLANNING AND PREPARATION FOR OFFENSIVE OPERATIONS UNDER NBC CONDITIONS

Offensive operations depend on thorough planning and preparation. Chemical staffs and units work with the operations planners from the start of the process.

METT-T Considerations

As the commander makes his estimate of the situation for an attack, he considers the factors of METT-T.

Mission

Fighting under the hazard of enemy NBC use may require additional control and coordination. The commander normally formulates more detailed orders to support his mission and intention under NBC conditions.

Enemy

Planners must consider enemy doctrine, capabilities, and probable intentions. Enemy first use of nuclear, biological, or chemical weapons maybe evident through intelligence indicators. If the enemy has already used these weapons, planners must know their agents, their delivery techniques, and their impact on the battle. Friendly forces must also understand the types of smoke and obscurants used and their impact on friendly and enemy sensors.

Terrain

and

Weather

Attacking forces normally have limited avenues of approach. The enemy will attempt to block these avenues. It may use contamination and obstacles containing chemical and flame weapons to restrict terrain use. Commanders identify these obstacles early and ensure that decon and smoke assets are available to support the breach.

When threatened by enemy NBC warfare, commanders exploit weather conditions that reduce the likelihood of NBC use. However, many of these conditions, such as precipitation and high winds, also impede other friendly operations, such as air support. When weather conditions favor enemy NBC use, commanders lessen the chances of employment of these weapons through speed, surprise, and rapid closure with the enemy.

Troops

The NBC readiness of friendly troops also affects the tactical plan. Planners must consider mobility under NBC conditions, protection against NBC attack, and final combat power at the objective. State of training and availability of resupply will drive success on the battlefield.

Time Available

Enemy use of NBC weapons will reduce time available to friendly units for preparation and movement. Friendly forces must take defensive actions and conduct extra recon. Friendly forces in an attack will try to gain time by slowing enemy reaction and confusing and disorganizing the defender. Smoke and obscurants disrupt the defender's operations.

Preparing for Attacks

Units require additional preparation time under NBC conditions. Units rehearse actions for responding to enemy NBC attacks. Commanders may implement additional control measures under battlefield nuclear warfare or the threat of biological or chemical strikes. These control measures support additional dispersion. They also facilitate the attack under limited visibility conditions.

Units may require additional logistics support under NBC conditions. Typically, attacks in high MOPP levels require additional artillery, since direct fire target acquisition is degraded when troops are masked. Attacks may also require additional smoke, because the forces are slowed by the physical demands of the MOPP gear.

CONDUCTING**OFFENSIVE****OPERATIONS UNDER****NBC CONDITIONS**

The attack must be violent and rapid. It integrates all available combat power, including nuclear fires when authorized. The attacker minimizes its exposure to enemy conventional, nuclear, and chemical fires through—

- Maneuvering and using counterfire supported by smoke and obscurants.
- Avoiding or rapidly crossing contamination.
- Maintaining operations, communications, and electronic security.
- Dispersing forces.

When an attack or exploitation includes a forward passage of lines, commanders ensure that forces do not congregate. Massed forces present a lucrative NBC target. The passed force provides information concerning the enemy, mine fields, and conventional or NBC obstacles. NBC recon and smoke units support these operations to provide necessary

information on clean lanes and obscurant support, respectively.

Extended operations in MOPP degrade combat force performance. Commanders prepare for increased difficulty in command and control under NBC conditions. Communications are less effective when personnel are in protective posture. Transmission time increases, raising vulnerability to enemy electronic warfare.

The commander must reach his objective with the combat power required to overcome enemy resistance. The attacking forces coordinate efforts to suppress enemy artillery, air defense, electronic warfare, and command and control. In particular they must destroy nuclear or chemical delivery systems and defeat the reserve. When authorized, the attacker uses friendly nuclear fires for these purposes.

Smoke on or near enemy positions blinds gunners and observers. Smoke between friendly and enemy forces screens friendly maneuver. Obscurants deceive the enemy across the battle area. Smoke supports river-crossing and obstacle-breaching operations. Friendly and enemy smoke present special problems in navigation, target acquisition, and surveillance.

Offensive operations include—

- Movement to contact.
- Hasty attack.
- Deliberate attack.
- Exploitation.
- Pursuit.

Movement to Contact

A movement to contact gains contact with the enemy and develops the situation. During this movement friendly forces use the principles of NBC defense. They use obscurants for concealment and deception. They take countermeasures against enemy use of obscurants and flame weapons. Commanders continue to use sound tactics, including speed, dispersion, and communications security, to help avoid being targeted for enemy NBC strikes.

Covering force elements report any NBC contamination encountered to the task force commander and mark its limits. Lead elements breach mine fields and reduce obstacles. These obstacles may include persistent chemicals. Smoke and decon assets assist in the reduction of these obstacles. Lead elements should, when possible, bypass contaminated areas.

The task force commander sets a minimum MOPP level for the force. Subordinate commanders increase

this level where appropriate, taking care not to put soldiers into advanced levels of MOPP too soon. Personnel train to operate in limited visibility and to use minimum communications. During periods of MOPP3 and MOPP4, leaders implement command drinking and rest periods.

The use of smoke and obscurants support the movement. During planning the commander identifies areas where terrain and vegetation do not provide sufficient concealment. He uses smoke units or smoke munitions to cover these areas. In addition he uses projected smoke to obscure known or suspected enemy observation posts. At locations where terrain analysis indicates probable enemy obstacles, the commander preplans smoke. This

preplanned support allows rapid breaching. Smoke is also integrated into the deception plan so that its use does not give away friendly plans.

Agile units plan for dispersal, use multiple routes, earmark reserves that are prepared for all conceivable contingencies, and adjust as necessary to enemy use of weapons of mass destruction.

**FM 100-5,
Operations, 1993**

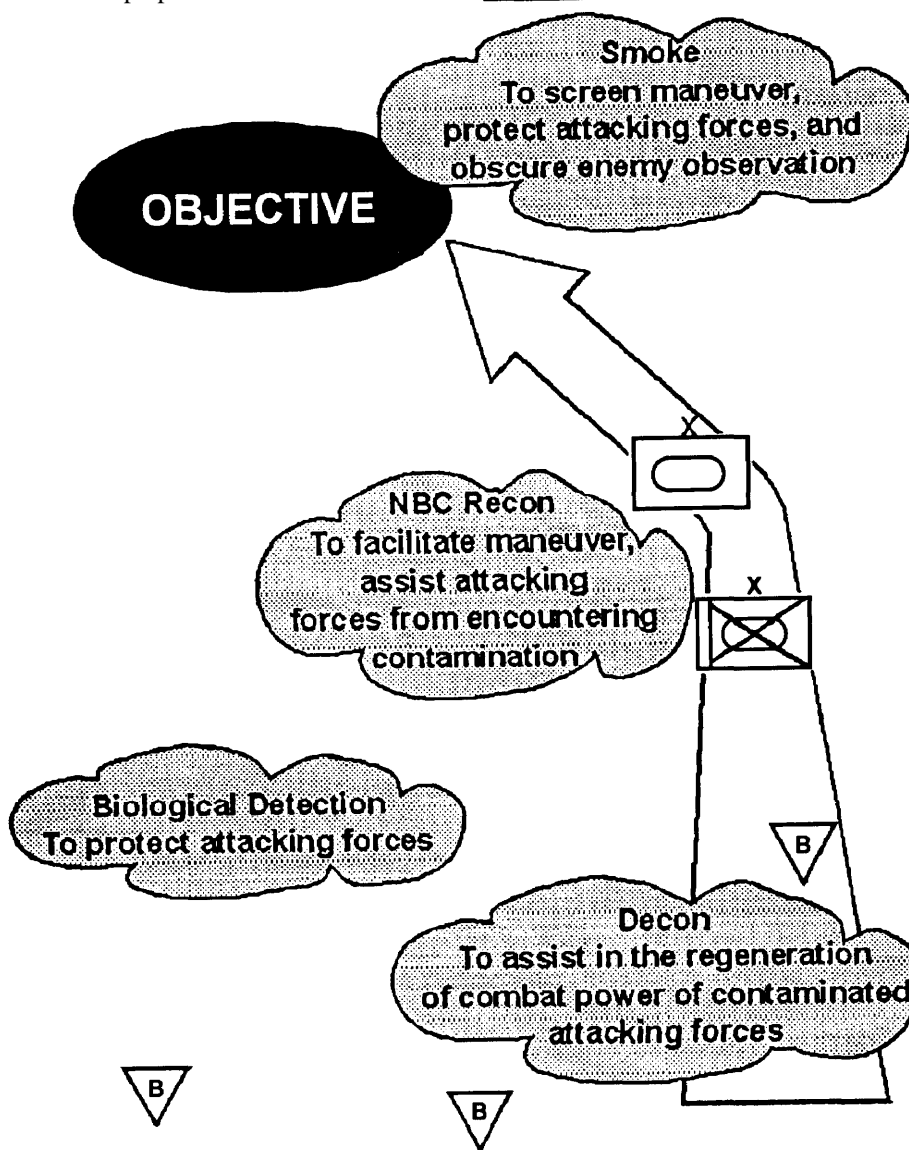


Figure 10-1. Supporting a deliberate attack with chemical support.

Hasty and Deliberate Attacks

Hasty attacks regain or maintain the initiative on short notice. Attacking forces use obscurants as a major combat multiplier in this option. They use immediate countermeasures to enemy smoke. These Countermeasures include electro-optical devices, counterbattery fires, and destruction of enemy smoke-generating equipment. Friendly troops prepare to withstand the destruction and shock effect of enemy flame weapons. They use NBC defense measures. When approved, deep nuclear fires support these operations.

Commanders conduct deliberate attacks against organized defensive positions that cannot be bypassed. The enemy may use NBC weapons to break the momentum of the attack or disrupt the synchronization of friendly assets. The attacker needs engineer support and obscurant assets to breach complex obstacle systems. These obstacle systems may include chemical mines and flame weapons.

reserves remain in concealed positions until required. These positions implement passive NBC avoidance measures, such as overhead cover, covered supplies and equipment, and a warning system. Where possible, commanders direct an NBC recon of routes into the zone of attack.

Friendly forces use obscurants in both hasty and deliberate attacks. Mortars, vehicle-launched grenades, and smoke pots obscure enemy target acquisition in the hasty attack. Additional planning time allows pre-positioning of ammunition for preplanned artillery and aerial-delivered rocket smoke. Mechanized smoke units screen routes of advance and aid in disengagement from the enemy.

Exploitation and Pursuit

Friendly forces follow initial success with relentless pursuit. Commanders use NBC recon to identify contamination along main routes of advance. A fleeing enemy may use chemical weapons more freely than one fighting a well-planned defense. The

retreating enemy commander may be willing to contaminate terrain. He may also be willing to accept large numbers of civilian casualties. In addition, he may use nuclear weapons previously kept in reserve.

When nuclear weapons have been authorized, attacking forces use them to destroy enemy nuclear and chemical delivery means and attack enemy reserves. The attacker may block escape routes with tree blowdown, fires, and rubble from nuclear attacks.

Projected smoke and vehicle smoke systems increase survivability in the exploitation and pursuit.

Artillery, mortars, mechanized smoke systems, and pots provide screening smoke for river-crossing and breaching operations. Obscurants also support consolidation, refueling, rearming, and casualty evacuation by degrading surveillance and target acquisition.

TRANSITION TO THE DEFENSE

Offensive objectives are of two basic types — those that focus on destroying the enemy and those that focus on seizing terrain. In either event the commander must recognize when he is approaching the culmination. At this point he will have expended so much of his strength and resources that he will lose his advantage over the enemy. He must shift to the defense long enough to rearm and refit to return to the offense. Chemical units support this shift. Smoke units conceal friendly positions and intentions. Decon units conduct thorough decon according to the command priority. NBC recon units actively patrol proposed routes to provide information to the commander. Air assault operations in an NBC environment can support the transition to the defense. Helicopters can allow combat units to bypass contamination; extract contaminated equipment and personnel; conduct air MEDEVAC of NBC casualties; and enhance the NBCWRS with aerial radiological and chemical recon.

Defensive Operations

This contamination forces

"...on 15 July 1918, the commander of the 30th Infantry, 3d Division, filed a graphic report of the unit's plight after repelling a German attempt to cross the Marne. His men, after being shelled with ... (mustard, chloropicrin and diphosgene) ... were 'absolutely worn out.' They had not had 'even a drink of water' during that time. If the men remained in their contaminated uniforms, he noted, they were certain to become gas casualties, because the mustard gas would eventually reach their flesh. It was 'absolutely impossible' to feed the regiment because the rations had been contaminated by the gas. He reported to the division that 'they are still there in the line and they will hold the line, but they ought to be relieved....' They were not."

--Leavenworth papers No. 10,
Chemical Warfare in World War I:
The American Experience, 1917 -1918,
1984.

Defensive operations are conducted with the immediate purpose of causing an enemy attack to fail. Defensive operations may also achieve one or more of the following: gain time; concentrate forces elsewhere; wear down enemy forces as a prelude to offensive operations; and retain tactical, strategic, or political objectives.

Defensive forces prepare to counter enemy NBC, smoke, and flame use. Defending commanders prepare plans to use obscurant and flame weapons. If nuclear weapons have been released, the unit incorporates them into its defensive plan. commanders integrate NBC defense, smoke, and flame throughout the defensive battlefield, concentrating on close and rear operations. When authorized, friendly forces use deep nuclear weapons against high-value targets. These deep strikes disrupt the enemy's movement and interrupt its command and control. In areas where counterattacks are not planned, friendly forces may contaminate terrain.

This action slows the enemy advance and may separate its echelons. Forward security elements conceal their activities and portray false locations with smoke. MBA units create obstacles and barriers under the cover of smoke. These barriers include flame weapons. These units also prepare NBC hardened primary and alternate positions. Decon elements prepare sites in the MBA and rear areas. Recon elements throughout the area of operations undertake an aggressive patrolling program to protect

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the commander's freedom of action. Rear-area units restrict the use of possible landing zones and drop zones with flame weapons.

CHARACTERISTICS OF THE DEFENSE

The characteristics of defensive operations are prepared positions, security, disruption, mass, concentration, and flexibility.

Preparation

The defender will arrive in the battle area prior to the arrival of the enemy and will make the most thorough of preparation as times allows. Use of enemy WMD can hinder and delay the preparation of the battlefield. The available time is reduced if soldiers are forced to operate in higher levels of MOPP. The use of smoke to conceal obstacle preparations and positioning of forces can disrupt the enemy's recon effort.

Security

Since a force defends to conserve combat power for use elsewhere, or at a later time, commanders must provide protection of their force. NBC defense is integral to protecting the force. Integration of NBC recon and biological detection assets to provide early warning is critical. The use of smoke to deny the enemy information concerning the defending unit enhances security.

Disruption

The defender disrupts attacker tempo and synchronization by countering his initiative and preventing him from massing overwhelming combat power. The use of smoke to slow and separate attacking forces alter the attacker's tempo and disrupt his synchronization. The integration of flame field expedients into the overall scheme of the defense can disrupt dismounted infantry attacks.

Mass and Concentration

The defender seeks to mass overwhelming combat power where he chooses and shifts mass repeatedly in accordance with his main effort. Since concentrations of the force increases the threat of large losses from WMD, commanders use concealment and deception to hide this vulnerability from the enemy. Active protection measures, such as

missile and air defenses, complement passive force protection measures (NBC defense).

Flexibility

The defender will choose where and when combat will take place. To deny the defender agility, the attacker may use persistent chemical agents to hinder defender flexibility. Reserve and striking forces can be attacked with WMD to delay and disrupt their introduction into the battle at the decisive point. Integration of NBC recon into these formations is critical to allow them to retain their freedom of maneuver. Use of smoke to conceal the positions of forces not initially engaged in the battle from enemy recon can enhance flexibility.

DEFENSE PATTERNS

There are two patterns of defensive operations — mobile and area. Mobile defense orients on the destination of the enemy force by using a combination of fire and maneuver, offense, defense, and delay to deter his attack. Area defense forces retain terrain. In an area defense friendly forces absorb the enemy into an interlocking series of positions. Here they destroy the entrapped enemy by fire. The commander's implementation of NBC defense, smoke, and flame use varies depending on the type of defense.

Mobile Defense

A defense that orients on the destruction of the enemy force by trading terrain to expose the enemy to a counterattacking mobile reserve. The minimum force possible is committed to pure defense; maximum combat power is placed in a striking force (with mobility greater than the enemy's) that catches the enemy as he is trying to overcome that part of the force dedicated to the defense.

Mobility is essential; however, NBC weapons used can cause terrain restriction (contamination, tree blowdown, or cratering) and hinder friendly mobility. Restricted mobility impedes the commander's ability to conduct a successful mobile defense.

Commanders train their units to cross or bypass contaminated terrain. Mechanized and armored forces can cross contamination rapidly but will become contaminated themselves. Forces may remain in MOPP for extended periods. An attack in this MOPP gear takes additional people and time for success. Therefore, commanders must plan to use larger forces or accept greater risk.

a'

Battalions and brigades travel in dispersed formations under battlefield nuclear warfare, chemical, or biological conditions. These dispersed formations prevent total destruction by a single nuclear or chemical attack. However, dispersed forces offer less immediate combat power. Enemy nuclear strikes against forested or urban areas create major obstacles to friendly movement. Fallout from enemy or friendly nuclear strikes creates hazards that require special protective measures.

commanders conducting mobile defense deploy relatively small forces forward to seize the initiative. The size and speed of these forces help protect them from direct NBC attack. These forces conduct their own NBC recon. They react quickly to reduce the effects of an NBC attack and are ready to conduct immediate and operational decon. They use smoke extensively to conceal their location and intention. They place obscurant on enemy positions to blind observers. These obscurants interfere with enemy target acquisition and engagement.

The striking force required for a successful mobile defense is a primary target for enemy NBC strikes. The striking force is the large mobile reserve that conducts the counterattack during the conduct of a mobile defense. As a norm the enemy will attack probable striking force locations with conventional or chemical fires. If the enemy knows the exact location, it may use nuclear fires to destroy the force. When stationary, the striking force protects itself through dispersion and hardening of positions. When moving, it closes with the enemy rapidly and violently to reduce its vulnerability. Real and deception smoke screens provide additional protection.

Area Defense

A defense that focuses on denying the enemy access to designated terrain for a specified time, rather than on the outright destruction of the enemy. A commander may conduct an area defense by using mutually supporting positions in depth. Where ground cannot be easily surrendered or when enemy forces are weak and disorganized, the commander may use a forward defense, which is an area defense with little depth. A perimeter defense is a type of forward defense, where a commander maintains the integrity of the perimeter by making his main effort well forward and counterattacking early.

The enemy attempts to attain victory through fire and maneuver. These fires may include chemical attacks. Enemy fire planners may use nonpersistent chemical agents along their route to support a breakthrough.

Where terrain exposes the enemy flanks, enemy forces may use contamination to provide security. The enemy will normally use screening smoke and high-explosive barrages to hinder friendly observation. Dust generated by the barrage blocks thermal and radar systems. As a countermeasure friendly forces place observers to the front and the flanks, outside the smoke, to adjust fires.

Commanders organize the defense around a static framework provided by planned defensive positions. These obstacles protect friendly positions and slow the attacker. Flame weapons enhance the effects of minefield and barriers and contribute to destruction, shock effect, and/or illumination. Nuclear fires destroy enemy forces before they can enter the battle.

Battle management reduces the impact of enemy NBC attacks. Vulnerability analysis and risk analysis provide the commander with critical information to determine positioning and protective posture. In addition, the warning and reporting system ties the battle area together with a timely picture of battlefield conditions.

NBC CONSIDERATIONS

DURING THE DEFENSE

A successful defense consists of reactive and offensive elements working together. The defending force resists and contains the enemy while seeking opportunities to go on the offense. The attacker may include NBC weapons, smoke, and flame in its attempt to penetrate the defense. It tries to limit the defender's ability to react and reduce the defender's combat power.

The defender uses the principles of NBC defense — avoidance, protection, and decon — to preserve its forces. Active and passive avoidance measures enhance the defender's survivability and sustainability. Protection saves lives and allows the unit to continue its mission. Decon of personnel and equipment regains lost combat power.

The defender uses obscurant to conceal its activities and dispositions from the attacking force. It uses deceiving smoke in conjunction with other electronic and physical deception measures to mislead the attacker. Smoke supports the defender taking the offense by disrupting enemy surveillance and target acquisition means. Simultaneously, the defender uses obscurant countermeasures to counteract the effects of enemy smoke and obscurant.

The defender incorporates flame weapons into its barrier plans. Flame weapons destroy and demoralize enemy forces and illuminate the battlefield. The defender covers its positions to reduce the impact of enemy air-delivered flame bombs. It prepares for enemy use of flamethrowers in close operations.

The commander maintains flexibility and synchronization of his own forces while disrupting enemy activities. He counters any tactical advantage the enemy can achieve with NBC weapons. If the enemy uses NBC weapons to cause casualties, the defender must protect his force. If the enemy contaminates terrain, the defender must be ready to cross that contamination or find alternate routes. If the enemy uses chemical weapons to degrade the defender through the burdens of protective posture, the defender must retaliate to force the attacker into a similar posture. The successful defending force must be better prepared than its adversary to survive, fight, and win on the NBC battlefield.

PLANNING AND PREPARATION OF DEFENSE OPERATIONS UNDER NBC CONDITIONS

METT-T Considerations

The following is a discussion on METT-T considerations; preparing the defense; and deep, security, close, reserve, rear, and retrograde operations.

Planning begins when a commander receives a mission to defend or perceives a need to do so. This planning integrates NBC considerations. The commander and his operational planners are guided by the factors of METT-T.

Mission

In the defense the mission identifies the area to be defended. The makeup of this area impacts on how the NBC assets are used. If the defense covers a broad front, the enemy will use its recon and intelligence-gathering sources to locate strongpoints and weakly defended areas. Friendly commanders use obscurant to deny the enemy this information. In a defense with limited trafficability the enemy may use NBC attacks and contamination against key

routes. Defenders may have to increase MOPP along these routes. Friendly commanders use recon assets to identify which routes are contaminated and which are not.

Enemy

Operational planners must know the enemy's doctrine, habits, equipment, and probable courses of action. The defending force conducts nuclear and chemical vulnerability analyses to identify the potential impact of attacks. It identifies probable enemy objectives and the weapon systems that support the attack. It establishes the probable enemy timetable. The friendly commander modifies his defense based on his estimate of enemy intent. He hardens his positions against possible NBC use. He also adjusts the MOPP level based on the need for mobility, perception of the threat, and responsiveness of his warning system. When authorized, he may use nuclear weapons to attack and delay enemy follow-on echelons.

Terrain and Weather

The defending force must exploit those aspects of the terrain that impair enemy momentum. When authorized, nuclear and chemical weapons augment conventional barriers and flame weapons to canalize or delay the enemy. The defender may use nuclear contamination to hinder the enemy's ability to mass or maneuver. The defending commander identifies key terrain. Some key terrain is so significant to the defense that its loss would prove decisive. The defending commander must fully implement NBC defensive measures to ensure that enemy NBC strikes do not force him from these positions.

Weather and visibility affect how defenders organize the ground. A position that offers visibility and good fields of fire in clear air maybe valueless in obscurant. Units must establish and rehearse movement to alternate positions. Weather has a major impact on the type and quantity of NBC munitions an enemy might use. Weather controls the length of time that terrain remains contaminated. In **addition**, **high** temperatures greatly increase degradation of combat efficiency in MOPP. Friendly commanders must assess the impact of current and predicted weather on friendly operations and vulnerabilities.

Troops

Mobility and protection are factors in how well a force can defend. Armor and mechanized forces can traverse nuclear or chemical contamination rapidly. However, light forces cannot carry the shielding to cross nuclear contamination safely. They can protect against chemical contamination but are likely to sustain heat, exhaustion, dehydration, and chemical casualties when crossing an area in MOPP4. Differences in morale, training, and leadership make some units better prepared than others to operate in an NBC environment. Commanders should exploit relative strengths of units, such as skill in obscurant operations, when designing the defense. Air assault operations in a NBC environment are highly advantageous. Light forces avoid contamination by flying over or around it. NBCWRS is enhanced by air assets conducting radiological and chemical aerial ardor ground surveys. Air MEDEVAC of NBC casualties, as well as extraction of contaminated personnel, is possible through the use of helicopter assets. In this case the unit limits contamination spread through use of plastic covers or other field expedient methods.

Time Available

Strong defenses take time to organize and prepare. Hardening these defenses against NBC weapons takes additional time. To gain time the commander may order a delay by a covering force. This force may operate under the concealment of smoke to develop the situation. When nuclear weapons have been authorized, commanders may gain additional time with barriers and craters created by nuclear devices. Nuclear strikes will produce tree blowdown, fires, and rubble when directed against forests or structures.

Defensive planning emphasizes the strengths of the defending force and terrain. Where terrain permits, mechanized forces use their mobility to fight a fluid defense. These forces locate and exploit the attacker's weaknesses. NBC recon identifies clean routes for movement. Smoke conceals the maneuver elements. When the defending unit consists of light forces, they capitalize on their ability to hold ground and mass fire. Since they will remain in one area, they construct NBC hardened positions under concealment of smoke. They locate observation posts forward and to the flanks. These posts can avoid the impact of friendly or enemy obscurant. In addition, the commander integrates decon assets into the defense. He plans to accomplish decon with

minimum impact on friendly operations. He reinforces natural barriers with man-made obstacles and flame weapons. Nuclear fire plans counter probable enemy threats involving massed forces.

To maintain security, prevent surprise, and retain his options for mass and maneuver, the defending commander must mask his preparations. He integrates his smoke plan with other active and passive deception measures. Extensive use of real and deception smoke screens conceals his positions and activities. Electronic, thermal, and auditory deception measures improve the effectiveness of deception screens. Recon and counterrecon allow him to see the battlefield while denying the same information to his opponent. Projected smoke is particularly effective in supporting counterrecon.

Preparing the Defense

Each element must wargame and rehearse its plans. Forces develop alternate routes and positions. Chemical units may prestock decontaminants and fog oil at forward supply points. They select and prepare alternate sites as time allows. Smoke units conduct recon to support smoke plans. Chemical recon units plan for methods to best support the defense.

Planners identify their PIR. Their early identification of enemy NBC capabilities and intentions enhances NBC defense. Indicators of NBC attacks provide early warning. Knowledge of enemy vulnerabilities supports friendly conventional and nuclear fire planning.

OPERATIONS IN DEPTH

The application of combat power — throughout the depth of the battle area — defeats the enemy rapidly with minimum friendly casualties.

Deep Operations

commanders conduct deep operations using fires or maneuver. Use of ground maneuver units in deep operations requires additional planning and coordination. These units must carry all supplies needed for the mission or depend on alternative measures such as aerial resupply. When aerial resupply is used, the commander must divert helicopters and Air Force aircraft from other critical missions. Units are also prepared to use MOPP gear for longer periods and assume additional risk if resupply is delayed. NBC defensive items, such as protective overgarments, require frequent resupply.

Close Operations

Division and corps commanders assign sectors to subordinate units for close operations. Priority of effort normally goes to the force responsible for the most critical sector. The corps commander implements his priorities by allocating resources. Among these resources are chemical units, nuclear weapons, and other combat multipliers.

Supporting unit Commanders plan for the use of these resources. These commanders establish their own priority of effort and further allocate units and munitions to their subordinate units. Some units, such as NBC recon elements, may provide general support. Others, such as decon units, normally operate in direct support. Commanders normally place smoke units in director general support.

Commanders apply the NBC defensive principles of avoidance, protection, and decon. Before the battle, units camouflage and harden their positions. They position alarm systems. Commanders decide how much dispersion is required and what level of MOPP is appropriate. Overhead cover will provide some measure of protection against contamination and air-delivered flame weapons.

When high MOPP levels are required, leaders delegate as many duties as possible. Leaders cannot be as physically active under MOPP conditions as in a normal environment. Disorientation and frustration are common. Exhaustion, dehydration, and mental fatigue may degrade leader effectiveness. When in MOPP gear, subordinates may fail to recognize when a leader becomes a casualty. Unit SOPs that prescribe methods for identifying key personnel while in MOPP aid in preventing this from occurring.

Commanders also consider the consequences of a prolonged stay in a contaminated area. At a minimum the commander must ensure the resupply of overgarments. If available, he provides a covered location for a latrine. If possible, he should establish a clean area with NBC collective protection to support resting, eating, and drinking. The commander must establish a system to exchange empty or contaminated canteens for full ones. He implements a command drinking program since troops in MOPP gear may not recognize their own water requirements. The commander coordinates resupply for contaminated supplies and food stocks that cannot be decontaminated.

The commander also establishes the type and priority of decon. Units normally must continue their defensive mission until relieved. Operational decon

may provide temporary relief from MOPP4. This relief extends the period troops can remain in the area without major loss of combat power. Thorough decon will be accomplished as soon as practical and may be accomplished in conjunction with reconstitution operations.

Friendly and enemy smoke screens exacerbate target acquisition and engagement difficulties. In addition, flamethrower or air-delivered napalm may reduce lightly constructed positions.

Security Operations

Screening forces or covering forces deploy in front of the forward edge of the battle area (FEBA). A screening force protects main battle area (MBA) units from surprise. It gains time for MBA commanders to reposition forces. Screening forces have fewer capabilities than covering forces.

A screening force normally conducts its own NBC recon. Decon is limited to basic skills and operational decon. It delays thorough decon until the unit has turned the battle over to MBA forces. Projected smoke, on-hard systems, and smoke pots help the screening force avoid decisive engagements. Smoke supports rapid disengagement when contact is forced. It conceals routes of withdrawal and screens the handover of the battle.

Covering forces delay or defeat leading enemy units. Under ideal circumstances a corps will use one or more ACRs as the covering force. However, it may use divisions or separate brigades for this purpose. The organic chemical element for these units provides smoke, decon, and NBC recon support for the covering force. This support may be augmented by corps chemical assets.

When the covering force can no longer support its forward positions, it hands over the battle to MBA forces. At this point the passage of lines is vulnerable to NBC weapons; this massing of forces presents a lucrative target.

Reserve Operations

The reserve preserves the commander's flexibility. Reserve forces may be squad-size or larger. They must be prepared to assume any mission. They may strike the decisive blow, block enemy penetrations, or reinforce committed forces. The reserve must be survivable and mobile.

Under chemical or biological conditions the protection offered by MOPP gear reduces combat

effectiveness. primary routes may expose troops to contamination. Under battlefield nuclear warfare conditions dispersion for survivability interferes with the capability to mass against a key position.

The commander and his staff must establish a posture that offers the greatest possible protection commensurate with mission, threat, and work load.

The reserve forces must also prepare for decon. If possible, in a nuclear- or chemical-threatened environment they remain in covered, hardened positions or inside vehicles until committed. If the terrain is contaminated, they may need to conduct a counterattack in MOPP gear. Where they are exposed to contamination, immediate and operational decon regain immediate combat power needed for their mission. Thorough decon can be accomplished at a later time.

Rear Operations

Protection of rear areas assures the defender's freedom of maneuver. To minimize vulnerability command and control and support facilities are dispersed and redundant. Typically, corps and ASCC chemical assets support rear-area missions.

Rear-area forces supplement NBC recon with their organic unit monitoring and survey capability. These units report results to the controlling headquarters for rear operations. This headquarters disseminates warning reports and overlays as necessary.

Smoke missions normally outnumber assets; therefore, smoke use is prioritized. Fixed sites and other critical static targets present a significant problem. The enemy normally knows the location of these sites. Obscurant may provide the only practical protection.

Fixed sites should be designed to integrate active and passive defense features. These features include dedicated smoke generators and techniques to lower the visible and electronic signatures. Where smoke is not integrated into the design, the defending commander may need to assign smoke units for point or area coverage. For a detailed discussion of rear operations see Chapter 12 of this manual, FM 71-100, or FM 100-15.

RETROGRADE OPERATIONS

Few significant differences exist in NBC considerations between retrograde and other defensive operations. The major difference is the

extensive chemical recon that supports movement to the rear. The enemy may use chemicals to canalize or restrict the movement of friendly troops. NBC protection is a high priority because of the potential for NBC attacks to disrupt and disorganize the movement. Deep operations with nuclear weapons, when authorized, impede the enemy's advance. So do barriers supported by smoke and flame.

Planning for logistics ensures uninterrupted support. CSS units displace at night or under cover of smoke. They plan for their own NBC defense. Retrograde actions consume large amounts of fuel, fog oil, and conventional munitions. If the enemy contaminates combat units or terrain, friendly forces will also require decontaminants. logistics planners need to position these items in depth. They must carefully monitor stockpiles to avoid destroying or evacuating these supplies unnecessarily. By positioning the supplies along routes of withdrawal, logistics commanders simplify support. They also reduce the enemy's ability to interfere with logistic operations.

TRANSITION TO

THE OFFENSE

The defensive commander continually plans to gain the initiative and transition to the offense. His goal is to control the enemy's attack and resume the offensive at the earliest possible time.

Chemical units support this shift to the offense. Smoke units conceal preparations for counter attacks. Where the tactical situation permits, decon elements restore friendly units' combat power by conducting thorough decon. Recon units seek multiple, clean routes of approach. These units report contamination throughout the battlefield to the commander. Chemical leaders and staff officers at all levels ensure that friendly NBC defense, smoke, flame, **nuclear** operations, support the commander's scheme of fire **and maneuver**.

Chapter 12

Rear Operations

"The single, most significant rear operations threat to U.S. forces ... the 'Battle of the Bulge.' During the breakthrough, German combat and diversionary forces threatened U.S. command post and logistic areas causing US support units and personnel to become deeply involved in the fighting."

FM 90-14, Rear battle, June 1985

Rear operations ensure freedom of maneuver and continuity of operations. Rear operations are conducted using the basic tenets of Army operations discussed in Chapter 2.

REAR AREA THREAT

Enemy forces may threaten rear areas during operations. Their purpose is to seize and maintain the initiative while degrading or eliminating a unit's flexibility and capability to sustain close operations. Rear-area activities are the most lucrative targets for enemy NBC use. Disruption of logistical operations by the use of NBC weapons is an integral part of enemy tactics. Attacking our sustainment nodes weakens main battle area force effectiveness, places persistent chemicals out of an enemy's immediate maneuver, and permits subsequent rapid and deep penetrations to achieve their operational objectives. To achieve these aims, threat activities in rear areas will target key critical support and logistic facilities and units with NBC and conventional weapons. These areas will include—

- Special weapon storage sites and delivery systems.
- Command and control facilities.
- Air defense artillery sites.
- Airfields.
- Seaports.
- Main supply routes.

Levels of Threat

Three levels of threat activity define planning rear operations. These levels focus on the nature of the friendly response required to defeat the threat.

• Level I threats are those that can be defeated by base or base cluster self-defense measures. Examples of a level I threat are—

- Enemy--controlled agent activities.
- Sabotage by enemy sympathizers.
- Terrorist activities.

• Level II threats are those that are beyond base or base cluster self-defense capabilities and can be defeated by response forces, normally MPs with supporting fires. Examples of a level II threat are—

- Diversionary and sabotage operations conducted by unconventional/special forces.
- Raid, ambush, and recon operations conducted by small combat units.
- Special or Conventional warfare missions.

Both Threat level I and II forces are capable of using CB weapons against rear-area units.

• Level III threats are those that necessitate committing a tactical combat force. Examples of a level III threat are—

- Heliborne operations helicopter-home operations.

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- Airborne operations.
- Amphibious operations.
- Ground force operations (for example, mechanized unit linkup with smaller airborne and assault units).
- infiltration operations.

These threat activities will not occur in a specific order nor is there a necessary interrelationship between levels. Rear areas may face one or all threat level activities at one time. Additionally, some level I and level II threat activities will likely begin well ahead of general hostilities.

In addition to introducing ground forces into rear areas, enemy doctrine integrates tactical air force and attack helicopter strikes; the delivery of long-range artillery, missiles, and rockets; and radio electronic combat into their deep operations planning.

Meeting the Rear Area Threat

The rear operations commander commands and controls the planning and execution of rear operations. The rear operations commander at division is the ADC-S; at corps, the deputy corps commander; and at EAC, the theater army commander. The theater army commander usually delegates coordinating responsibilities for rear operations to the ASCC who in turn delegates to his ASG commanders. The rear operations commander exercises his rear operations responsibilities through the rear command post (CP) at corps and division. At EAC, the TA, ASCC, and ASG commanders exercise their responsibilities **through their respective** operations centers.

INTEGRATION OF NBC DEFENSE INTO REAR OPERATIONS

The three fundamentals of NBC defense discussed in Chapter 4 must be integrated throughout all CS and CSS operations in the rear area.

Contamination avoidance and control are key to reducing the effects of the NBC battlefield. Since rear-area activities make the most lucrative targets, they use the passive measures of contamination avoidance before hostilities commence to minimize the effects of NBC attacks. Once NBC weapons have been used, units implement contamination control that encompasses decisions to limit the spread of contamination and reduce or eliminate its effect on sustained operations. Further, systems warning, reporting, locating, and identifying NBC hazards are

emplaced to give indication of presence or absence of these hazards and what type hazard is present in order to determine duration and recognize symptoms.

Protection and decon measures must be taken when NBC contamination is unavoidable. Individual soldiers and units upgrade their MOPP level and seek collective protection for rest and relief. Collective protection must be provided to critical functions, such as operations cells and medical treatment facilities. Decon operations reduce the immediate NBC hazards and bring a unit back to some degree of mission effectiveness. Decon also may allow troops to reduce their MOPP level and operate in a contamination-free environment. Protection and decon need to be integrated into all work and rest and relief activities.

SYNCHRONIZATION OF SUSTAINMENT

The CSS cell of the rear CP plans and directs sustainment operations throughout the rear area. Synchronization of sustainment with the commander's concept of operation is critical to the success of close and deep operations. Rear operations ensure that sustainment is not degraded and do not limit the commander's freedom of maneuver while maintaining continuity of operations under NBC conditions. Task organization of chemical units supporting rear operations should be tailored to IPB and vulnerability analyses and keyed to each phase of the battle. The division chemical officer provides advice on coordinating US and host nation assets at critical times to maintain sustainment. NBC recon, decon, and smoke units, controlled by a chemical battalion working with the rear CP operations cell, and tactical combat forces (TCFs) support sustainment throughout the rear.

To the degree possible, CSS facilities are dispersed to minimize the effect of enemy NBC attacks. The CSS cell at corps and below and the ASCC/ASG at EAC must anticipate, plan, and coordinate the relocation of CSS units in the rear area as situation changes.

Coordination with many organizations is critical. Terrain management and response to NBC events influence a broad range of logistical activities. Key operators include transportation, supply, engineer, and military police. Coordination with S3/G3s (higher, lower, and adjacent) is imperative to assess the impact on present and future operations. Also, the rear CP coordinates through the G5 for HNS for sustainment operations in the rear area.

INTELLIGENCE

In the division and corps, the operations cell of the rear CP is responsible for the rear-area IPB. The rear CP operations cell uses IPB products from the division, corps, or TA it supports. Combined with information gained from transiting units, it prepares intelligence updates and identifies likely enemy targets and intentions. This estimate, along with information on the current enemy situation, is disseminated to all units in the rear area; it forms the basis for planning and conducting the rear-area NBC defense operations.

One of the functions of the rear CP operations cell is to gather and disseminate early warning information regarding enemy air activities. It collects air threat early warning information from the division, corps, and EAC air defense early warning nets; Army airspace command and control element at each echelon; Air Force tactical air control party airlift element; and other Air Force control teams that may be operating in the rear. Once the warning is received, the rear CP operations cell immediately notifies the tactical combat force, response forces, and all bases and base clusters in the rear area.

BASE AND BASE CLUSTER OPERATIONS

Each base and base cluster commander integrates NBC defense considerations designed to detect, defeat, and minimize the effects of enemy NBC attacks. He bases this integration on the IPB provided by the rear CP, his own IPB, the current intelligence situation, and an analysis of his unit(s) mission requirements. To maximize unit mission accomplishment, defense plans must remain flexible. This flexibility will allow for differing degrees of preparation based on the probability of enemy activities. Base cluster commanders will basically rely upon the NBC assets from their cluster units.

Plans

Defense plans include analyses of critical functions and priorities for NBC survivability actions. NBC recon, decon, smoke, and flame operations are integrated for base cluster defense plans. Obscurants may be used to improve survivability during windows of increased vulnerability, such as imminent air attacks, command post displacements, or critical operations like fast refuel, ammunition transfers, or

MSR repair. Reconstitution sites, staging areas, or loading activities by base clusters are more survivable and less detectable under obscurant screens.

Obscurant hazes and self-defense smoke use are best for rear operations in order not to complicate mobility and coordination of logistic actions. Some trade-offs need to be made between the level of increased survivability with the logistical cost of sustaining the smoke screens. Large-area smoke screens restrict enemy air-landing zones and, along with deceptive screens, enhance rear-area missions. These plans should also include—

- Use of observation posts/listening posts and/or patrols.
- Assignment of defense sectors to subordinates.
- Integration of available weapons into the defense.
- Identification of unit response forces.
- Air, ground, and NBC attack alarm systems.
- Obstacle planning.
- Area damage control.
- Internal air defense measures.
- Fire support planning.

Defense plans include MP units providing area security and/or battlefield circulation control in the vicinity of the base or base cluster. The rear operations cell integrates those into the overall rear defense and the support plans. Defense plans will be coordinated with adjacent bases and base clusters to maximize mutual support and to prevent killing each other. Flame is used to complement defense plans and restrict use of the LZ/DZ.

Operations

Units operating in the base or base cluster submit requests for NBC recon, decon, and smoke support to the base or base cluster commander. Some bases and base clusters may have chemical units located with them.

Base or base cluster commanders will establish an operations center capable of maintaining 24-hour communications with the rear operations cell for intelligence, tactical information, and/or direction and with their parent organization for unit mission guidance. Additionally, base or base cluster commanders will establish communications with and have operational control to direct defensive operations of other units occupying terrain within their base or base cluster.

Large fixed sites, such as ports, airfields, and railheads, require thorough base or base cluster defense planning. These sites are likely to be

pretargeted before hostilities begin. See FM 341 or FM 90-12 for fixed site planning considerations.

Mission-essential civilians should to be identified so that they can be given NBC equipment, such as MOPP gear, and trained to use it. Individual, such as forklift operation, vehicle mechanics, and dispatchers, who are critical to mission accomplishment are mission essential. Bases will normally deny entry to non-mission-essential civilians during wartime. However, the commander is responsible for ensuring NBC protection of official civilian visitors to the base.

WARNING AND REPORTING

Units in the base or base cluster submit their NBC reports to the base or base cluster operations cell and to their parent unit simultaneously. They also warn adjacent units within the base or base cluster. The base or base cluster operation cell submits its NBC reports to its next higher headquarters rear CP operations cell at corps or the rear CP at division. The base or base cluster operation cell warns adjacent bases or base clusters, host nation counterparts, cluster units, and sister services. See Chapter 3 for discussion of the NBCWRS.

AREA DAMAGE CONTROL OPERATIONS

Area damage control (ADC) operations facilitate the return of base or base clusters to mission capability with effective planning, establishment of specific responsibilities, and use of all available assets. ADC forces (organic or support) focus on a rapid response to aid in a base or base cluster's recovery following an attack. ADC measures are those taken before, during, and after hostile action or natural disasters to reduce the probability of damage, to minimize its

effects, and to aid in the continuation or reestablishment of normal operations (see FM 90-23 for the list of these measures). The rear CP operations cell, along with their associated NBCC, will designate the response to bases or base clusters who require additional chemical support. Response may include HNS. Once designated, ADC forces must coordinate with supported bases or base clusters to assist in recovery. ADC resources should not be expended for removing rubble and debris that have no bearing on mission accomplishment.

The commander's concept and intent, the rear-area IPB, and the rear CP operations cell operations officer's priorities drive ADC force planning. ADC forces meld this information into their own IPB and position themselves in the area where they can best provide timely support to threatened high-priority facilities.

The TA commander is responsible for ADC in the COMMZ and establishes overall priorities. The TA deputy chief of staff for operations sets and prioritizes overall ADC requirements relative to the TA's mission and capabilities. He establishes these priorities in coordination with the senior theater component commands, supported area commands, and supporting TA functional commands. The ASCC commanders and ASG commanders are responsible for planning ADC operations that use assets within their areas. They plan ADC operations through their respective rear CP operations cell. Senior commanders of bases and installations within the COMMZ coordinate requirements for ADC with the TA commander. At EAC, overall NBC functions (comprising NBC defense, decon, and smoke) are normally the responsibility of the host nation. However, chemical units are available to all AASCS and ASGs to provide NBC defense, decon, and smoke support to all units in the ASCC area of responsibility. See FM 90-23 for further discussion of ADC operations.

Chapter 13

Unified, Joint, Combined, and Special Operations

"At the direction of the French corps commander, General Passaga, instructions were posted in every dugout and shelter in the (American) 1st Division on proper procedure during a mustard gas attack. The troops were told to put on the British mask when the first gas shell fell and to keep it on for four hours after a gas bombardment. Anyone passing through the area was to beat and shake his clothes before entering a dugout, and to use soap suds as a first aid treatment for liquid mustard on the skin. Further instructions from Passaga in late January were based on recent gas attacks against the (French) 42nd Division, where most of the casualties had occurred as a result of faulty gas proofing of dugouts and of poor gas mask discipline.

The instructions, however, did not prevent a soldier from washing his hands in a shell hole filled with mustard-contaminated water."

-- The 1st Division at Ansauville, Jan - Apr 1918.

US Army Chemical Corps Historical Studies:

Gas Warfare in World War I, 1958.

The 1st Division conducted combined operations under the XXII Corps of the French Army.

US Army forces in conflict or war do not operate alone. They form part of a unified or joint command with other US armed services. Service components engage in unified and joint operations to enhance their total effectiveness in air, land, and sea military operations. Treaties and international agreements also cause these forces to participate in combined operations with forces of allied nations. In this century our major warfighting experiences have been in joint and combined warfare. Future wars involving NBC weapons on a large scale may well occur in this context.

UNIFIED AND

JOINT OPERATIONS

A theater commander controlling unified and/or joint forces integrates NBC defense, smoke, and flame operations into his theater plans to support his strategic and operational objectives. At the strategic level of war the primary NBC goal is deterrence. If deterrence fails, the secondary NBC goal is to cause

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the enemy to cease NBC warfare at the lowest level favorable to US forces. At the operational level of war the commander uses appropriate nuclear operations or conventional retaliation to accomplish the strategic objectives.

The theater commander's primary NBC responsibilities is NBC defense for the total force. Nuclear weapons employment is a separate category apart from NBC defense. Nuclear weapons employment is described in FM 101-31-1. He conducts NBC defense to enhance synchronized and unified effort. Unified and joint operations use the standardized NBC warnings and reports defined in FM 3-3 and FM 3-3-1. Light forces normally deploy with a brigade-plus for low-intensity conflicts. If intervening headquarters are not available, they report directly to the joint force commander. Chemical downwind message/effective downwind message (CDM/EDM) generation may originate from the joint operational level. The Forward Area Limited Observer Program (FALOP) represents another viable source of CDM data.

NBC Defense for the Total Force

NBC defense for the total force combines the principles of NBC defense, obscurant, and flame operations with a proactive theater-level program of NBC recon, intelligence, obscuration, and deception. Theater-level recon and intelligence gather information on the state of the battlefield and enemy preparedness. Large-area obscuration increases survivability of amphibious operations, enhances protection of port and airfield activities, and reduces vulnerability of joint logistics over the shore operations. Deception at the theater level supports large-scale maneuver. This program supports operational readiness for unified and joint operations.

Operational readiness describes the capability of a unit, weapon system, or equipment to perform the mission or functions for which it is organized or designed. The term expresses a specific level or degree of readiness or a general assessment of how well a force can accomplish its mission. To maintain operational readiness in support of unified and joint operations, commanders—

- Assess enemy NBC capability and intent.
- Include appropriate annexes to OPLANs.
- Assess whether automatic masking procedures should be directed and what conditions should apply.
- Provide NBC protection guidance.
- Assess readiness of joint forces under NBC conditions.

- Determine requirements for chemical units (i.e., smoke, decon, NBC recon).
- Determine HNS needs for NBC defense and consult with allies.
- Determine how to sustain operations under NBC conditions (for example, survival of critical fixed sites and mission-essential personnel, resupply of chemical defense equipment treatment of casualties).
- **Assess resiliency of the C² system under NBC conditions.**
- Determine NBC defense requirements for mission-essential personnel.

During unified and joint operations an effective program of NBC defense will allow friendly forces to maintain a net advantage in operational tempo under NBC conditions. This US advantage may force adversaries to cease offensive NBC warfare to continue the conflict on terms more favorable to them. Additionally, NBC defense allows friendly units to continue necessary combat operations under NBC conditions. This continuation ensures successful mission accomplishment.

Logistical Guidance

US unified and specified commands prepare supporting NBC defense annexes during the joint operational planning process. Include logistical guidance as appropriate. The annexes are part of the OPLANs that involve significant deployment of forces to or within a theater of war. They outline general requirements and critical tasks necessary to execute the OPLAN. They also contain an assessment of the chemical capability required by the OPLAN.

Other Services and Agencies

The joint force commander can direct the Army to furnish NBC defense and smoke support to other services or agencies. When no Army command exists in the required area, he can attach chemical units to another service.

COMBINED OPERATIONS

US Army chemical units may participate in combined operations with forces of allied nations. In theaters where the United States has forward deployed forces, they follow principles and procedures developed in peacetime. Existing procedures guide relations with the NATO in Europe and the Combined Forces command (CFC) in Korea. For theaters in which

contingencies occur, and international agreements do not exist, forces adjust doctrinal applications, at the operational or tactical level, to remain within the CINC's emplaced strategic boundaries. Normally, US forces are required to request approval from the host nation through civil-military channels for actions that impact the host nation's environment, personnel, or civil-military operations. This includes approval for decon sites and smoke operations.

Interoperability

Multinational forces achieve interoperability through standardization of—

- programs and policies to train and educate the individual soldier and to build unit partnerships.
- Doctrine, SOPs, and international agreements.
- Equipment, supplies, ammunition, and weapons.

US chemical doctrine implements existing international agreements. Accords include NATO Standardization agreements (STANAGs) and US-UK-CA-AUS quadripartite standardization agreements (QSTAGs). NBC defense and smoke doctrine must be compatible so that forces of one nation can effectively assist another. NBC decon and recon are particularly critical. Combined forces must establish common marking, identification, warning, and reporting systems.

Language and cultural differences can cause misunderstandings even when there are common procedures. When possible, units should have liaison personnel who are fluent in their allies' languages. Bilingual lists of symbols and key NBC defense and military terms assist soldiers to perform together effectively.

The sustainment of units is normally a national responsibility when operating with an ally. NBC defense planners must carefully consider sustainment requirements in a combined environment.

Host Nation Support

US national policy includes maximum use of host nation support. This lessens the number of support units the US armed forces would otherwise have to deploy to support the combat forces in a theater of operations.

The use of host nation assets to perform NBC defense and smoke tasks depends upon the nature of the tasks and the ability of the host nation to provide support. Available resources and agreements concerning their use are prime factors in this decision. Payments for contractor services (personnel or materiel) and locally

procured supplies and equipment are processed by the servicing finance unit (see FM 14-7). The host nation can provide either military or nonmilitary resources.

Allied

Government

Agencies

The government builds, operates, and maintains support facilities in many countries. These facilities include weather reporting stations and communications and intelligence facilities. These agencies operate their facilities to support their services and US requirements by agreement.

Civilian Contractors

and

Civilian Employees

Contractor service can be local, third country, or US contractor using indigenous or third country personnel. Mission-essential personnel providing critical support need NBC protective equipment and training to ensure continued support for sustainment. Provisions to conduct this training are subject to negotiation between US and host nation forces.

Type B Unit

Augmentation

These units use limited US military personnel who provide only essential leadership and technical expertise. Host nation personnel fill the remaining positions upon unit deployment. The units provide host nation military units within the US structure. This permits direct supervision of local national soldiers by their own officers and noncommissioned officers. These leaders, in turn, report to the US command structure.

Military Units

The host nation may provide military or paramilitary units to support US requirements for NBC defense or smoke.

Supplies

and

Equipment

Some supplies and equipment such as decontaminants may be more readily available locally than through the US logistics system.

NATO Operations

The NATO alliance covers a wide range of cultures, languages, governments, allied forces, terrain, and climate. Long-standing agreements and established headquarters with international staffs ease the difficulty of using chemical units in this diverse environment.

Most chemical units operate in a national organization at corps level or below. Cross attachment of allied chemical units is achievable through equipment and procedural interoperability. Corps or theater chemical units can have a specific mission to support allied units. In this circumstance US Army chemical units would be under operational command of the allied maneuver unit.

Each allied nation provides combat service support to its own forces. However, US chemical units can obtain common supply items from allied units and, in turn, provide items to them.

US chemical units in the COMMZ operate in territory under the control of allied governments. These governments use territorial forces to conduct rear operations. They coordinate HNS for US forces. US NBC defense and smoke activities in the COMMZ take place in coordination with the territorial forces.

Within the Federal Republic of Germany the territorial forces provide NATO chemical forces with expertise on the local terrain, available resources, and equipment to perform NBC defense and smoke missions.

Operations With the Republic of Korea

The CFC consists of forces from the United States and the Republic of Korea (ROK). Interoperability in much of the doctrine and capabilities between US and ROK forces enables successful combined NBC defense and smoke operations. Most chemical units in Korea remain within their own national organizations and receive support from them. Combat support coordination teams in ROK army corps also facilitate working relationships between US and ROK units for combined NBC and smoke planning.

SPECIAL OPERATIONS

Special operations (SO) are actions conducted generally in enemy-held, denied, or sensitive territory by specially trained, equipped, and organized military forces in pursuit of national military, political, economic, or psychological objectives. These operations are essentially of a political-military nature and are affected more directly by political considerations than conventional operations. Special operations may be conducted to meet threats across the operational continuum. They may support or be supported by conventional operations. They may be conducted independently when conventional operations are inappropriate or not feasible. SO may involve forces that are directly controlled by higher echelons, up to the NCA, often with minimal involvement of intermediate headquarters. They are frequently of a sensitive, high-risk nature and may require oversight at the national level. They differ generally from conventional operations in their operational techniques, mode of employment, distance from friendly support, and dependence upon detailed operational intelligence and indigenous assets. By their nature, SO are usually very difficult to support with chemical mission areas.

US Army SOF are comprised of active and reserve component special forces, special operations aviation, rangers, and selected special mission and support units. Also included under SOF management and service proponentcy are active and reserve component civil affairs and psychological operations units. All SOF have a limited chemical infrastructure and except for small special forces NBC detachments, no organic chemical units. SOF must rely heavily on detection and contamination avoidance. Deployed SOF detachments and their indigenous forces (in unconventional warfare) are normally foot mobile and carry all essential equipment with them. Extended wear of MOPP is unacceptable under almost all circumstances. Timely and accurate intelligence, use of field expedients, foreign or captured NBC equipment, and maximum use of weather and terrain are key principles for SOF operating under NBC conditions.

Chapter 14

Operations Other Than War

"The Army does not exist to serve itself, but it exists to serve the American People."

General E.C. Meyer

"Army chemical units are trained and equipped to provide support in many technological accidents or incident situations."

FM 100-19, Domestic Support Operations, 1993

The Chemical Corps' primary focus is to provide combat support to assist the Army fight and win our nation's wars, but the Army and the Chemical Corps will find themselves engaged in operations that may not involve combat. The Chemical Corps is well suited for a number of missions in support of operations other than war (OOTW).

Operations other than war include those operations conducted during peacetime and conflict short of war. It is also possible that these type of operations can be conducted during war as an adjunct to the main effort.

Contingency operations during peacetime normally focus on assisting US, allied, or friendly nation civil authorities to cope with natural or man-made disasters. Typical missions are—

- 1 Humanitarian assistance and disaster relief.
- 1 Arms control/treaty verification.
- 1 Support to domestic civil authorities.

Contingency operations during conflict are usually time-sensitive military operations characterized by rapid power projection of combat forces. These operations include—

- 1 Counterterrorism.
- 1 Security assistance.
- 1 Humanitarian assistance.
- 1 Counterdrug.
- 1 Peacekeeping.
- 1 Arms control/treaty verification.
- 1 Attacks and raids.
- 1 Noncombatant evacuation.
- 1 Support to insurgency or counterinsurgency
- 1 Support to domestic civil authority.

C O U N T E R - T E R R O R I S M

In the past, terrorist groups have attempted to obtain chemical weapons. As growth of NBC weapons continues, this possibility increases. Chemical staffs and units will support counter-terrorist operations by providing NBC defense training to key individuals. Special forces NBC recon detachments can conduct special recon operations to locate terrorist NBC storage sites and/or manufacturing facilities. Chemical units and staffs can provide technical advice and assistance once terrorists have used NBC. Chemical units and staffs operating in areas where there is a high terrorist threat must take terrorist countermeasures. Soldiers should be trained in common-sense *terrorism countermeasures*. FM 100-37, Terrorism Counteraction, provides guidance on unit countermeasures.

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SECURITY ASSISTANCE

During the Gulf War, chemical personnel provided security assistance to friendly and allied nations. This assistance involved training of allied military forces in NBC defense techniques. Both chemical staffs and units can provide security assistance support. The Security Assistance Training Program (SATP) has two components - International Military Education and Training Program (IMETP) and foreign military sale program (FMSP) training. The objectives of these programs are—

- Develop skills required to operate and maintain acquired US equipment.
- Develop a foreign country's expertise in effective management of its defense establishment.
- Foster development of a foreign country's professional and technical training capability.
- Promote US military rapport with counterparts in a foreign country.
- Promote a better understanding of the US, its people, political system, institutions, and way of life.
- Increase the awareness of international military personnel on the US commitment to human rights.

IMETP is designed to advance the efficiency, professional performance, and readiness of the recipient armed forces. This training is normally conducted in CONUS, but can occur in other countries. The methods of training vary; formal courses, orientation tours, and on-the-job training are several methods.

FMSP allows eligible foreign governments to purchase defense equipment, services, and training from the US. Training on the maintenance and operation of the equipment is accomplished by two methods — mobile training teams (MTT) or field training services (FTS). MTTs are military personnel on temporary duty to train foreign personnel. The team's size and composition are based on the request submitted by the host nation. The objective of the training is to develop an institutional base with the host nation so that they can then train themselves. FTS is a long-term MTT that can consist of military or civilian employees or contract personnel.

HUMANITARIAN ASSISTANCE

These operations provide emergency assistance to victims of natural or man-made disasters abroad. Chemical staffs and units provide specialized

assistance in chemical- or nuclear-related disasters. This can include monitoring and survey, detection and identification of hazards, and decon. In disasters not involving chemical or nuclear hazards, chemical units can provide general support. This support includes providing showers, off-the-road water haul, and limited firefighting capability.

COUNTER-DRUG OPERATIONS

Chemical staff personnel can provide technical expertise to military units involved in counter-drug operations. The manufacturers of illegal drugs use and produce many dangerous chemical compounds. Chemical corps personnel can provide technical advice in the handling and disposal of dangerous chemical materials.

Chemical personnel can provide advice on the destruction of drug labs and related materials using flame field expedients or using defoliants to destroy drug crops.

PEACEKEEPING OPERATIONS

Peacekeeping forces deployed in countries that possess NBC weapons will require support from both chemical staffs and units. Chemical staff officers and NCOs need to be included at all echelons within the military peacekeeping command. A senior chemical staff officer with a broad range of expertise needs to be included on the staff of the military peacekeeping command. This command exerts overall control of the peacekeeping forces and is normally multinational. The military peacekeeping force commander exercises operational control of the subordinate military forces. Under the military peacekeeping command are military area commands. The military area commands usually consist of a single nation's military force and operates in a specific geographical area.

Chemical staffs organic to the military organizations deployed in a peacekeeping role will provide NBC staff support to their organizations. If the military unit does not have a chemical staff, then the organization should be augmented with a JA or JB team. Ad hoc chemical staffs also can be formed. Depending on the situation and the NBC threat involved, chemical units may be deployed. The organization and type of chemical support package is dependent on METT-T. At a minimum, a chemical

company team should be deployed to provide the necessary C² and logistical support. The use of smoke can provide the peacekeeping commander a valuable means of enhancing force protection through non-lethal means.

A R M S C O N T R O L / T R E A T Y V E R I F I C A T I O N

Arms control focuses on promoting strategic military stability. Chemical staff personnel provide technical assistance on monitoring the growth of NBC weapons and technology. Chemical officers occupy staff positions in agencies responsible for nuclear and chemical weapons treaty verification. Chemical units and organizations are involved in the demilitarization of chemical munitions and associated equipment.

A T T A C K S A N D R A I D S

Attacks by ground, air, and naval forces are used to damage or destroy high value targets or to demonstrate our capability to do so. These operations involve the swift penetration of hostile territory to secure information, seize an objective, or destroy targets and end with a planned withdrawal. Chemical staffs and selected chemical organizations may participate in the planning or the execution of attacks and raids. This is especially true if the high value targets are WMD research, production, or storage facilities.

N O N C O M B A T A N T E V A C U A T I O N O P E R A T I O N S

This type of operation is conducted when the situation in a country requires the evacuation or relocation of US citizens, selected host nation personnel, and third country nationals. The operation may take place in a low threat environment or require combat action. Chemical staff personnel will be involved if the host nation possesses an NBC capability. Additionally, chemical personnel can provide expertise on the use of RCAs.

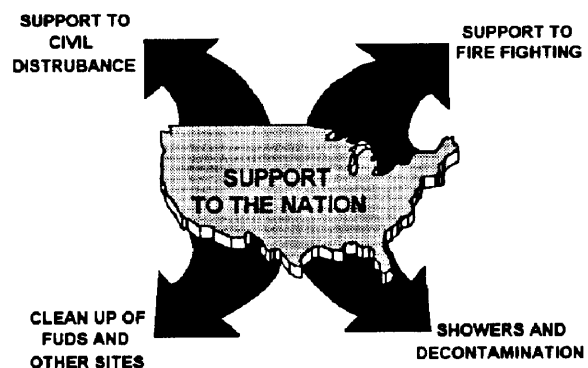
S U P P O R T T O I N S U R G E N C I E S O R C O U N T E R I N S U R G E N C I E S

Insurgencies are organized movements to overthrow a constituted government through the use of subversion and armed conflict. The National Command Authority (NCA) may direct US forces to assist either insurgent movements or host nation governments opposing an insurgency. Chemical staff personnel can provide expertise on the use of RCA, flame weapons and commercial chemical threats. As the growth of NBC weapons spreads across the globe, it is possible that forces involved in insurgent/counterinsurgent operations could see the use of chemical weapons. Smoke units could provide smoke screens to obscure friendly activities from hostile forces.

D O M E S T I C S U P P O R T

Support to US civil authority are those activities carried out by the military in support of Federal and state officials. These activities are limited by the Posse Comitatus Act. Support provided by chemical units can include disaster assistance, civil disturbance control, and hazard materials response. Decon units can provide an off-the-road water haul capability, fire fighting support, and decon of hazardous spills. Chemical units can provide expertise on the use of RCA during civil disturbance control operations. See FM 100-19, Domestic Support Operations for more detail.

Many organizations are actively involved in providing domestic support. One organization that is involved is the Chemical - Biological Defense Command (CBDCOM), located in the Army Material Command (AMC). CBDCOM has many missions, to include



the destruction of the nation's chemical weapons stockpile. The Technical Escort Unit (TEU) (figure 14-1), a battalion-level organization, subordinate to CBDCOM has the mission to respond world wide to accidents dealing with chemical munitions or suspected chemical agents. The TEU was a major component of the Department of Defense response to the Silver Valley incident in 1992. During construction work in Silver Valley, a formerly used defense site (FUDS) in Washington DC, several World War I era chemical munitions were uncovered. The site had been used as a test range for testing chemical munitions during and just after World War

I. The TEU and other agencies responded, to include a decon platoon, to this incident. All chemical munitions were removed from the site without any release of hazardous materials.

Chemical personnel, because of the technical expertise in dealing with battlefield hazards and their location in almost all Army tactical organizations from company to theater army will assist in advising commanders on the environment. Because of this, all chemical personnel must understand the how their operations will impact the environment during training and war.

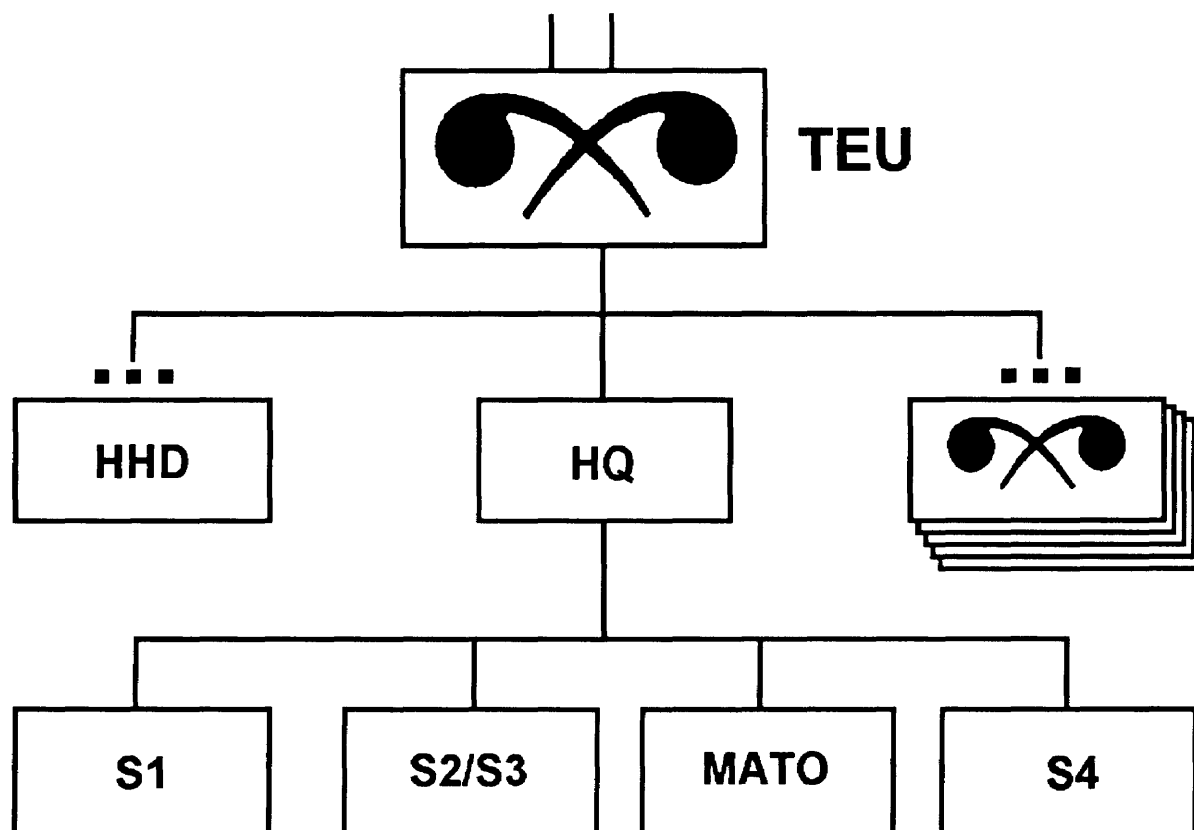


Figure 14-1. Organization of the Technical Escort Unit.

Appendix A

Responsibilities of NBC Personnel

This appendix addresses the responsibilities of the company chemical NBC, battalion personnel, brigade personnel, and division chemical section. The duties outlined are minimum operational duties. They are listed to help chemical personnel and their supervisors and commanders better understand the capabilities and uses of chemical personnel. Additional duties the commander may assign should not detract from accomplishing these primary duties first.

This appendix addresses the responsibilities of the company chemical NCO, battalion personnel, brigade personnel, and division chemical section. The duties outlined are minimal operational duties. They are listed to help chemical personnel and their supervisors and commanders better understand the capabilities and uses of chemical personnel. Additional duties the commander may assign should not detract from accomplishing these primary duties first.

C O M P A N Y C H E M I C A L N C O

The company chemical NCO position calls for an MOSC 54B20 soldier. This NCO works in company operations where he is immediately available to the **company commander as the primary advisor for all NBC matters. The NCO supports combat readiness** by training first-line supervisors, so they can train individual soldiers in NBC- related tasks. NBC NCOS also advise on, conduct, monitor, and evaluate NBC training within the company. This NCO also **demonstrates proper techniques for operation and maintenance of NBC equipment and analyzes unit training needs.**

Intelligence

- Receive, prepare, correlate, and disseminate information on enemy NBC attacks.
- Ensure key personnel have received an appropriate, **specific NBC threat briefing pertaining to their mission.** Also, make sure that all newly assigned personnel receive an unclassified NBC threat briefing.

Training

- Advise on methods to integrate NBC defense into all aspects of unit training.
- Assist in establishing and reviewing unit-level mission-essential tasks. Provide recommendations to ensure battle tasks can be performed under NBC conditions.
- Train first-line supervisors to provide proper, informed training to individual soldiers.
- Train and ensure continued proficiency of unit NBC defense equipment operators.
- Forecast NBC training ammunition requirements.

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Evaluation

- Conduct periodic evaluations of unit NBC preparedness through the conduction of individual and unit NBC defense tests.
- Ensure that appropriate sections, squads, or platoons have personnel trained to operate and maintain the assigned NBC defense equipment.
- Use the results of platoon drills, common task tests (CTT), Army Training and Evaluation Programs (ARTEPs), and other evaluations to improve NBC readiness.

Readiness

- Report NBC equipment status as required by higher headquarters.
- Help the company supply sergeant determine authorizations and forecast NBC equipment to support training.
- Help the company supply sergeant maintain status of shelf-life items and rotate them as required.
- Ensure all contingency NBC equipment is included for in unit load plans.

Logistics

- Supervise operator/crew maintenance of NBC equipment.
- Ensure that supply sergeant and prescribed load list (PLL) clerk requisition NBC-related items. Maintain document numbers for all requisitioned items.
- Inventory and report status of NBC equipment as required by higher headquarters.
- Help unit leaders fit, package, and issue individual chemical defense equipment.
- Recommend the use of funds to replace shortages, expendables, and items consumed in training based upon authorizations contained in appropriate publications.
- Coordinate turn-in of unserviceable NBC equipment.
- Ensure radiacmeter calibration and/or certification is current.

Administration

- Maintain and update the NBC annex to the unit SOP.
- Maintain close coordination with battalion chemical officer/NCO. Keep them abreast of NBC-related activities.
- Maintain and update NBC-related publications.
- Maintain mask status chart.
- Ensure all soldiers are screened for optical inserts.

- Maintain list of personnel exempt from CS exposure.

Field Operations

- Supervise use of NBC equipment, including protective gear.
- Provide commander with unit OEG.
- Receive, prepare, correlate, and disseminate information on enemy and friendly NBC attacks.
- Monitor or supervise immediate, operational, and thorough decon operations.
- Make recommendations to the commander on decon and smoke support.
- Maintain basic loads of NBC items in coordination with the supply sergeant.
- Supervise use of unit NBC defense personnel.
- Advise on the use of flame.

BATTALION PERSONNEL

Maneuver battalion personnel consist of the chemical officer (lieutenant), a battalion chemical NCO (staff sergeant), and a decon specialist (specialist 4). Each nonmaneuver battalion has a chemical staff NCO (sergeant first class) and a decon specialist. In addition, a battalion staff officer is appointed as additional- duty NBC officer. The battalion chemical section trains personnel and helps plan NBC operations. These soldiers supervise technical aspects of battalion and subordinate unit NBC operations. They also help subordinate company chemical NCOs. They recommend to the S4 use of funds for NBC equipment or supplies. They must periodically report authorizations and on-hand and on-requisition status. Also, they must know budgeting and forecasting principles.

Intelligence

- Provide technical assistance to the S2 for analysis of the NBC threat and ensure the analysis is reflected in unit OPLANs and SOPs.
- Receive, relay, and disseminate information on enemy NBC attacks.
- Help the S2 coordinate activities of any attached or assigned NBC recon elements. Recommend employment to unit commanders.
- Ensure that key personnel receive an appropriate, specific NBC threat briefing pertaining to their mission. Also, make sure other newly assigned personnel receive an unclassified NBC threat briefing.

Personnel

- Serve as the professional developers for company chemical NCOs. Train company NCOs in MOS-related subjects and monitor assignments.
- Ensure full use of subordinate unit chemical personnel. Promote integration of nonchemical personnel into chemical activities.
- Maintain the status (name, rank, and departure) of company chemical NCOs. Report to higher headquarters chemical section as required.
- Provide technical information to help the S1 prepare casualty forecasts.

Training

- Coordinate and monitor battalion NBC defense training. Ensure the integration of NBC defense training in all aspects of training.
- Assist in establishing and receiving unit-level mission-essential task list. Provide recommendations to ensure battle tasks can be performed under NBC conditions.
- Evaluate individual and collective NBC training. Determine training needs and recommend training required to correct deficiencies.
- Project NBC training ammunition requirements in coordination with the S3 and S4.
- Train and supervise a crew from the battalion to conduct operational decon.

Evaluation

- Evaluate unit's ability to operate under NBC conditions.
- Use the results of platoon drills, ARTEPs, and other evaluations to improve NBC readiness.

Readiness

- Monitor NBC equipment status.
- Determine authorizations, forecast NBC equipment to support training and basic loads.
- Advise the S4 on shelf life and rotation of NBC stocks.
- Ensure that all contingency NBC equipment is included for in unit load plans.

Logistics

- In coordination with the S4, monitor for expenditure of funds provided for NBC defense equipment.
- Monitor outstanding requisitions and NBCDE

maintenance.

- Forecast and monitor inventories of NBCDE, as required by higher headquarters, in coordination with company chemical NCOs.
- Recommend the use of funds needed to replace shortages, expendable, and items consumed in training based upon authorizations contained in appropriate publications.
- Conduct periodic NBC equipment inspections.
- Supervise the NBCDE calibration program. Integrate it with the battalion's calibration program.

Administration

- Maintain the NBC annex to the battalion SOP.
- Maintain and update NBC-related publications.
- Maintain close contact with subordinate units and higher headquarters. Keep them abreast of NBC activities.

Field Operations

- Receive, correlate, and disseminate information on NBC attacks.
- Consolidate subordinate unit OEG and radiation status information. Report to higher headquarters as required.
- Perform MOPP analysis.
- Integrate NBC threat analysis into the IPB process.
- Organize and establish (as required) a battalion NBCC. Coordinate and supervise activities of radiological survey and monitoring teams and chemical detection teams.
- Recommend use of supporting decon, NBC recon, and smoke units.
- Coordinate decon missions conducted with or without support from a decon unit.
- Report NBC equipment and personnel shortfalls to higher headquarters.

BRIGADE

PERSONNEL

The brigade, DISCOM, and division artillery chemical sections consist of the chemical officer (captain) and an NBC staff NCO (sergeant first class). Cavalry regiments, separate brigades, and theater defense brigades have a larger NBC staff.

The brigade chemical officer works as a special staff officer under the staff supervision of the brigade executive officer. The brigade chemical officer/assistant S3 works under the supervision of the brigade S3. Through staff visits, coordination, and inspections of subordinate units, the brigade

chemical section serves as a focal point for NBC operations. It assists subordinate units in all NBC defense areas to improve NBC readiness. In other brigade-level organizations, NBC may have expanded roles. For example, a d DISCOM chemical section, in coordination with the G4, the division chemical officer, and the respective COSCOM, deals with stockage, unit pre-positioning, and resupply of chemical defense equipment.

Intelligence

- Provide technical help to the S2 for analysis of the NBC threat and ensure that PIR and threat information are reflected in unit OPLANs and SOPs.
- Help subordinate units in their threat analysis and evaluate/disseminate information to key and newly assigned personnel.
- Integrate NBC recon assets into unit recon and surveillance (R&S) plans.

Personnel

- Provide recommendations concerning assignment of chemical personnel.
- Help professional development of company and battalion chemical personnel.
- Ensure proper use of subordinate unit chemical personnel and promote integration of nonchemical personnel into chemical activities.

Training

- Monitor NBC defense training and integration of NBC defense tasks in all aspects of training.
- Determine training needs through staff visits and evaluations. Recommend training required to correct deficiencies.
- Assist in establishing and reviewing unit-level mission-essential task list. Provide recommendations to ensure battle tasks can be performed under NBC conditions.
- Project NBC training ammunition requirements in coordination with S3 and S4 representatives.
- Give technical staff help to subordinate units. Explain individual and collective training policies, procedures, and guidance.
- Plan and coordinate NBC training.
- Make sure ARTEP NBC common module tasks are included in all mission-related training and evaluations.
- Ensure achievement of at least minimum standards of proficiency by all individuals and units.
- Make maximum use of post or area NBC defense courses. Ensure quotas are provided to units needing

them most.

- Ensure medical training in a contaminated environment is included in exercises.

Evaluation

- Use results of ARTEP unit evaluations, internal and external ARTEP evaluations, and field training exercises (FTXs) to improve NBC readiness.
- Evaluate NBC readiness through the maintenance of NBCDE, use of funds, use of personnel, and quality of training provided.
- Monitor and evaluate subordinate unit NBC proficiency.

Readiness

- Help subordinate units determine authorizations and forecast of NBC equipment to support training and war reserve stockage.
- Help the S4 cross-level NBCDE to obtain the best overall NBC readiness posture.
- Inspect rotation of shelf-life items, load plans for NBC war reserve stocks, and deployment plans/SOPs related to NBC defense.
- Monitor and recommend input of NBC-related data into unit status reports. Correct deficiencies if possible.

Logistics

- Help S4 and maintenance personnel follow up outstanding requisitions and NBC equipment maintenance procedures and priorities.
- Conduct spot checks of subordinate unit NBC equipment on hand and on requisition.
- Ensure subordinate units forecast sufficient funds to replace shortages, expendable, and items consumed in training.
- Help plan to rotate forward pre-positioned stocks of NBCDE and decontaminants.
- Develop plans for equipping and training mission-essential civilians.

Administration

- Maintain the NBC annex to the brigade SOP.
- Maintain and update NBC-related publications.
- Maintain close contact with subordinate units and higher headquarters. Keep them abreast of NBC activities.

Field Operations

- Receive, prepare, correlate, and disseminate information on enemy NBC attacks.

- Consolidate battalion radiation status. Report to division as required.
- Provide recommendations concerning MOPP levels appropriate for enemy threat and tactical situation.
- Integrate NBC threat analysis into the IPB process.
- Establish and operate the brigade NBC subcollection center. Coordinate activities and reports with appropriate host nation territorial organizations.
- Perform vulnerability assessment.
- Recommend employment of supporting NBC recon, smoke, and decon units.
- Report NBCDE and personnel shortfalls to the division chemical section.
- Provide NBC input to plans, orders, and SOPs.
- Plan for the brigade chemical staff personnel to assume the mission of the division NBCC should division NBCC become nonoperational.

DIVISION CHEMICAL SECTION

The division chemical section is a part of the special staff section. It usually is under the staff supervision of the division chief of staff. See FM 3-101 for the organization of the division chemical section. The section helps the commander and staff by providing information, estimates, and recommendations on NBC matters. The members of this section help the principal staff officers prepare plans, orders, and reports. The division chemical officer recommends, plans, supervises, and coordinates the mission requirements. He performs these duties for the division chemical company and nondivisional chemical units (such as mechanized smoke or smoke/decon companies) assigned, attached, or OPCON to the division.

Intelligence

- Help the G2 analyze and disseminate divisional NBC threat information.
- In coordination with the SWO, ensure NBC effective and chemical downwind messages are passed to subordinate commands.
- Receive, prepare, correlate, and pass information on enemy NBC attacks.
- Recommend use and collection tasks to the G2 for assigned or attached NBC recon elements.
- Help G2 evaluate captured NBC-related foreign material. Recommend urgency of evacuation for further exploitation.
- Ensure countermeasures developed in threat

analysis are incorporated into division plans and procedures.

- Provide technical assistance for interrogating enemy prisoners of war about NBC matters.

Personnel

- In coordination with the G1 and AG, provide recommendations for assignment of division chemical personnel.
- Coordinate professional development of subordinate command chemical personnel.
- Ensure full use of subordinate unit chemical personnel. Promote integration of nonchemical personnel into chemical activities.
- Actively participate in chemical personnel and unit force structure planning and programming.

Training

- Conduct MOS and NBC defense course training for command personnel. Monitor general status of NBC training throughout the command.
- Assist in establishing and reviewing unit-level mission--essential task list. Provide recommendations to ensure higher headquarters-approved battle tasks can be performed under NBC conditions.
- Promote total involvement of the chain of command in NBC training.
- Supervise and inspect subordinate command individual and unit NBC proficiency testing.
- Ensure that NBC training — including medical aspects in a contaminated environment—is routinely integrated into all training events.
- Ensure divisional and subordinate command NBC school programs of instruction are approved and meet minimum standards and requirements.
- Obtain training support available from host nation resources.
- Plan and integrate NBC training to maximize the use of critical NBC collective tasks found in ARTEP MTPs as well as soldiers' manual common tasks.
- Determine training needs through staff visits and evaluations. Recommend training required to correct deficiencies.

Evaluation

- Use the results of CTTs, internal and external ARTEP evaluations, and informal FTXs to improve NBC readiness.
- Evaluate NBC readiness through the maintenance of NBCDE, utilization of personnel, and quality of training provided.
- Provide the divisional G3 with an NBC inspector,

as required, for formal unit evaluations of all NBC areas during AGIs.

- Actively participate in preparation, coordination, and conduction of external ARTEP evaluations and ARTEP unit tests.

Readiness

- Receive, collate, and disseminate NBC readiness status as required by higher headquarters.
- Monitor NBC personnel, equipment, and training shortfalls and recommend policies and programs to improve readiness.
- Periodically inspect rotation of shelf-life items, load plans for NBC war reserve stocks, and deployment plans and SOPS related to NBC defense.
- Ensure NBC readiness is clearly shown in unit status reports.

Logistics

- Request funds early in the fiscal year to replace shortages, expendable, and items consumed in training. Monitor equipment status and make requests based upon needs of the command.
- Recommend plans and programs for forward deployed, pre-positioned stocks of NBCDE and decontaminants.
- Help develop and effect policies and plans related to NBC matters.
- Provide, through the divisional chemical company, an adequate decon plan for all assigned or attached units.
- Recommend improved procedures for replacement of chemical items of equipment.

Administration

- Ensure NBC-related publications are maintained and updated for section and IG use.
- Update NBC portions of divisional SOPS.
- Provide guidance on changes in doctrine, equipment authorizations, and new items of equipment to be fielded.

Field Operations

- Receive, prepare, correlate, and pass information on enemy NBC attacks, as the focal point of the division's NBCWRS.
- Monitor radiation status of subordinate units as required.
- Integrate NBC threat analysis into the IPB process.
- Establish and operate the division NBCC. Coordinate activities and reports.
- Recommend, plan, supervise, and coordinate mission requirements for the divisional chemical company and other NBC units assigned, attached, or OPCON.
- Perform vulnerability assessment.
- In coordination with operations personnel, logistics sections, and subordinate commands, allocate NBC equipment and personnel to those subordinate commands.
- Provide NBC estimates and input to combat plans and orders.
- Based upon tactical situations, recommend employment of organic and supporting chemical assets.

Appendix B

Levels of Proficiency for NBC Defense Personnel

This appendix addresses the levels of proficiency for NBC defense personnel and provides a recommended organization for NBC defense.

This section implements STANAG 2150,
NATO Standards of Proficiency for
NBC Defense.

BASIC STANDARDS OF PROFICIENCY

Individual soldiers must be trained in the concept of NBC defense in order to survive under conditions of NBC attack or hazards stemming from collateral damage. Through individual NBC defense, soldiers make their contribution to the survivability and operating proficiency of their unit in an NBC environment. There are two levels of individual proficiency - survival and basic operating. Survival standards are those that the individual must master in order to survive NBC attacks. Basic operating standards are those which the individual must master in order to contribute towards the continued operations of the unit as a whole under NBC conditions.

Survival

To meet survival standards of proficiency in NBC defense, the individual must be able to:

- Recognize nuclear and chemical attacks and take protective action.
- Be aware of the effects of biological attack.

- Recognize NBC alarms and signals.
- Recognize the existence of a chemical hazard and indications of a biological attack and take protective action.
- Properly don, seat, clear and check protective mask within prescribed standards.
- Take protective measures against thermal radiation (light, flash, and heat), blast, and nuclear radiation effects of nuclear explosions.
- Conduct immediate decontamination procedures.
- Remove protective mask using proper procedures.
- Perform first aid (self aid and buddy aid) for injuries caused by chemical agents or nuclear weapons.
- Practice a high order of health, personal hygiene

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and sanitation discipline as a protective measure against the spread of disease.

- Properly don protective clothing and be familiar with procedures for relieving himself while wearing that clothing and properly performing assigned missions/tasks while wearing protective clothing.

Basic Operating Standards

To meet basic operating standards of proficiency in NBC defense, the individual must be able to perform the survival standards listed above and:

- Properly use individual NBC protective equipment and maintain it in a high state of serviceability.
- Demonstrate an understanding of specific actions required of him by his/her unit's standing operating procedure (SOP) for maintaining operating efficiency during and after NBC attacks, including the necessary preparations before an attack in order to reduce the effects of NBC weapons.
- Recognize or detect chemical agent contamination and perform simple decontamination of his person, clothing, personal equipment, individual weapon and position, vehicle and crew-served weapon.
- Recognize all standard marking signs that indicate chemically, biologically or radiologically contaminated areas.
- Cross or by-pass marked NBC contaminated areas with minimum danger to himself.
- Demonstrate proficiency in performing his/her primary military duty, to include the use of crew/personal weapon(s), while wearing the protective mask and NBC protective clothing for extended periods. These periods are to be determined by the commander, based on such factors as weather conditions and equipment specifications.
- Properly remove his contaminated protective clothing according to the fixed undressing procedures as outlined in SOPs or other (e.g., nations) regulations.
- Be familiar with the effects of nuclear, biological and chemical weapons.
- Be familiar with the principles of collective protection, including passage of contamination control areas (CCAs), shelter organization and operation, where applicable.
- Demonstrate familiarity with the use of a dosimetric devices where applicable.

Basic Standards for Selected Personnel

Requiring Additional Training

To accomplish operational tasks beyond the scope of mere survival, certain selected personnel require additional training beyond the scope of individual standards but not to the degree required by specialists. Such tasks are NBC monitoring, survey, recon and contamination control.

Personnel trained in NBC monitoring, survey and recon must be able to:

- Recognize nuclear and chemical attacks and fully understand unit procedures for implementing warnings.
- Detect chemical agents and radiological hazards.
- Operate and maintain NBC specialist equipment applicable to the task.
- Conduct NBC surveys and continuous monitoring.
- Where practicable monitor personnel, food, drinking food, drinking water and equipment for NBC contamination and effectiveness of decontamination measures.
- Where possible, collect samples of suspected biological contamination and forward them as directed.
- If ordered, collect samples of liquid or solid chemical agents.
- Mark, where possible NBC contaminated areas, complete equipments, supplies and stores with standard marking signs in accordance with FM 3-3 and 3-3-1.
- Provide data for compilation of NBC reports in accordance with FM 3-3 and 3-3-1.

Personnel trained in contamination control must be able to:

- Perform necessary decontamination of supplies, equipment and areas for which they are responsible in the performance of their primary duties.
- Operate and maintain assigned decontamination equipment.
- Where applicable establish and operate a personnel decontamination station.
- Take measures where possible before and after an attack to avoid the spread of contamination.

All officers and enlisted personnel, in addition to basic survival skills are required to have knowledge appropriate to their rank and operational role, of:

- Deployment of NBC sentries and detection devices.
- NBC monitoring, survey and chemical recon.
- Survival procedures before, during and after an NBC attack and friendly nuclear strike.

- Chemical downwind hazards.
- Radiation dose control and exposure rules.
- General protective values of material against radiation, including the selection of buildings and the construction of shelters.
- The effects of prolonged wearing of NBC protective clothing on the morale and combat efficiency of personnel.
- The planning of operations, appropriate to their formations/units/sub-units, taking account of an NBC threat.
- Assessing the effects of NBC attack on operations involving their unit.
- The NBC defense organization and equipment available to the unit or headquarters.
- Contamination control.

BASIC STANDARDS OF PROFICIENCY FOR SPECIALISTS

Officers and enlisted personnel are required whose primary duties are concerned with the coordination of all unit NBC defense activities.

Specialists are:

Chemical Battle Staff Officers and Enlisted. Chemical Corps personnel assigned to full-time duty in NBC defense. Such personnel will normally be at units at the company level and above.

Unit NBC Defense Officers and Enlisted Personnel. Personnel assigned on an additional duty basis to form the NBC Control Party. These personnel should meet the level of company (or equivalent) but may meet a higher level,

Standards

Chemical Battle Staff Officers and Enlisted Personnel in cooperation with the functional groups of the staff as necessary, must be able to:

- Assist the commander in providing policy and guidance to lower echelons in all matters pertaining to the development of an NBC defense capability.
- Monitor NBC defense training within the command.
- Evaluate the capability of lower echelons to survive NBC attack and to continue operations in an NBC environment.
- Keep abreast of new concepts and techniques in NBC defense.
- In time of war, act in the capacity of adviser to the commander on all matters pertaining to NBC defense of subordinate units/formations. In addition,

augmented as necessary, be responsible for NBC data collection, analysis and reporting.

- Propose deployment of special NBC defense elements/units, if available.
 - Where appropriate, operate and maintain calculators and computers and possess basic knowledge of the structure of programs used in NBC warning and reporting.
- Unit NBC Defense Officers and Enlisted Personnel** (Assisted by Enlisted Altercates) must be able to:
- Provide technical assistance to the commanders and staffs on NBC defense training and operations.
 - Coordinate the unit's NBC defense activities.
 - Give NBC defense instructions to achieve basic operating standards of proficiency for the unit and the individuals of the unit.
 - Plan and supervise NBC defense training aspects of operational training exercises and maneuvers.
 - Supervise preparation of unit NBC defense SOPs.
 - Supervise operation and maintenance of NBC material.
 - Determine by dosimetry or by calculation (as appropriate) total dose, time of stay in, and/or transit through radiologically contaminated areas to avoid exceeding command exposure guidance.
 - Prepare fallout prediction patterns.
 - Plan NBC recon and advise commanders on best routes to cross or by-pass an NBC contaminated area.
 - Plan and coordinate decontamination within the unit and advise his commander on all aspects as time factor, terrain manpower etc.
 - Maintain records of unit radiation exposure.
 - Estimate downwind hazard for chemical attacks.
 - Report NBC data to next higher headquarters.
 - Analyse the vulnerability of the unit to NBC attack.
 - Evaluate individual and unit competence in NBC defense and advise the commander on the unit's ability to survive and to continue operations in an NBC environment.
 - Advise the commander on all matters pertaining to unit NBC defense. In addition, augmented as necessary, be responsible for NBC data collection, analysis and reporting.
 - Where appropriate, operate and maintain calculators and computers and possess basic knowledge of the structure of programs used in NBC warning and reporting.

SURVIVAL AND UNIT BASIC OPERATING STANDARDS

Each unit must develop and maintain a capability for the successful accomplishment of its mission in a NBC environment. Planning and training for this capability will include preparation of a unit NBC SOP and frequent exercises to ensure familiarity in application of the SOP. Unit standards of proficiency are shown as “survival” and “basic operating”.

Survival

In order to survive a NBC attack, a unit must be able to:

- Take immediate and correct action on being warned of an imminent nuclear or chemical attack or arrival of a chemical agent or radiological fallout.
- Determine the presence and nature of NBC hazards in the unit's area and take effective measures (to mitigate, to the extent possible, the effects of NBC attack).
- Properly use unit NBC protective equipment and supplies, and maintain them in a high state of serviceability and readiness.
- Enforce a high order of health, hygiene and sanitation to minimize the spread of disease following a biological attack.

Basic Operating

In order to meet basic operating standards of proficiency, the unit must be able to perform the survival standards listed above and:

- Practice a high degree of protection while continuing to conduct the primary mission of the unit.
- Perform necessary decontamination of supplies, equipment and areas for which they are responsible in the performance on their primary duties.
- Delineate the area of NBC hazard.
- Cross, by-pass or function in contaminated areas with minimum loss of efficiency, decontaminating where necessary.
- Delineate contaminated areas and mark using standard signs in accordance with FM 3-3 and FM 3-3-1.
- Operate efficiently over extended period of time (period to be determined by the commander based on such factors as weather conditions and equipment specifications) with personnel in full protective equipment, including wearing of the respirator/protective mask for long periods, and a

period of operations, away from vehicles, where this applies to arms of the service concerned.

- Report nuclear detonations, biological and chemical attacks and associate hazards and hazard areas in accordance with FM 3-3 and 3-3-1 and directives from higher headquarters.
- Assign NBC personnel based on standards of proficiency stated above.

GUIDE TO ORGANIZATION FOR NBC DEFENSE

The organization which best meets the need of one unit/formation will often not be applicable to another unit. For example, it is not possible to equate the organization of personnel and material for decontamination tasks in a hospital with the organization required within an infantry company. Similarly, a highly mobile infantry force will have different priorities and possibilities for NBC defense from an artillery unit.

However, it is still possible to state principles of organization which are universally applicable regardless of the size or mission of the unit. It is also possible to provide guidance to commanders in establishing an NBC organization which will meet the needs of most units, with the view that principles are to be employed by unit based on their mission and situation.

Guidance for commanders in establishing unit NBC defense organization is contained below and is only a recommendation.

Principles

The lowest level of unit which may be required to function as an independent entity must have an independent capability for survival and for those specialist tasks essential to maintenance of operations for a limited period.

Higher units must have the capability of providing for their own defense and maintenance of operations. In addition, they must have the capability of rendering support to the smaller units to enable operations to continue.

The designation of specific personnel to specific responsibilities in the area of unit NBC defense is mandatory. However, the normal command and staff structure should be followed to ensure that NBC defense is thoroughly integrated into unit SOPs.

Regardless of the size or mission of the unit, tasks essential to NBC defense remain the same and differences are only of degree. The elements of NBC defense are avoidance, protection, and decontamination.

Priorities for measures of NBC defense in an actual NBC environment must be decided upon by the commander in the situation bearing in mind the primary mission of the unit and the time, personnel and material available to mitigate the effects of the NBC attack. Measures for individual survival, however, are the responsibility of the individual and must be effected by individual initiative.

Responsibility

The commander is responsible for the readiness of his unit/formation to operate with maximum individual and unit effectiveness under NBC conditions. It is also mandatory that selected officers and enlisted personnel possess knowledge of those principles and techniques of NBC defense commensurate with his level of command. Finally, the commander, according to the given Table of Organization and Equipment (TOE) and national orders, must establish a NBC defense organization and ensure that personnel assigned to tasks in this organization receive specialized training.

Organization

Commanders of companies or equivalent sized units which do not have assigned NBC specialists should appoint on an additional duty basis one NBC Defense Officer/NBC Defense Senior Grade NCO and one enlisted Non-Commissioned Officer (assisted by one enlisted alternate). These personnel will form the NBC Control Party and will be trained to perform the tasks outlined in Appendix C.

Commanders of companies should assign and make training available for personnel in the following specialist areas:

- **Monitoring and Survey Team.** Each team should consist of a primary instrument operator and an assistant. One primary and one alternate monitoring and survey team should be appointed for each authorized radiological detection instrument and for each authorized chemical agent detector kit. Only the primary team will be equipped with the instruments. Personnel assigned to these teams should be trained to perform the tasks outlined in Appendix C.
- **Decontamination Team.** Each team should consist of one enlisted man in charge and several other enlisted men, including a Monitoring and Survey

Team. This team should be trained to perform the tasks outlined in Appendix C.

Normally, one Decontamination Team will be assigned per company; however, company commanders must carefully consider their potential requirement for decontamination, bearing in mind the mission and the vehicles or weapons assigned to the company.

To assist in formulation of policy and procedures and to supervise training, battalion headquarters, which are not assigned an organic Chemical Battle Staff Officer, should appoint an NBC Defense Officer on an additional duty basis in the operations and training section and ensure that this officer receives the necessary NBC training. Those headquarters which are not assigned an organic Chemical Battle Staff NCO should appoint an NBC Defense NCO and one enlisted alternate and ensure that these personnel receive the necessary training. These personnel will be responsible for evaluating the adequacy of NBC defense for units/formations subordinate to the headquarters. In addition, these personnel will comprise the NBC Control Team and, hence, will be responsible for the NBC defense of the headquarters to which they are assigned. This NBC Control Team should be augmented as necessary to enable NBC data collection, analysis and reporting.

BASIC STANDARDS OF PROFICIENCY - CIVILIANS

All civilians employed in wartime posts by national or NATO military agencies must be trained in surviving an NBC attack and in continuing to operate in their functions in a contaminated environment. Appropriate standards of proficiency in both areas are listed under survival and basic operating standards.

Survival

To meet survival standards of proficiency in NBC defense a civilian must be able to:

- Recognize nuclear and chemical attacks and take protective action.
- Be aware of the effects of biological attack.
- Recognize NBC alarms and signals.
- Recognize the existence of a chemical hazard and indications of a biological attack and take protective action.
- Properly don, seat, clear and check protective mask within prescribed standards following an alarm or

recognition of a chemical or biological attack.

- Take protective measures against thermal radiation (light, flash and heat), blast and nuclear radiation effects of nuclear explosions.
- Carry out immediate individual decon drill.
- Follow procedures for protective mask removal.
- Perform first-aid (self-aid and buddy-aid) to include assisted ventilation techniques when possible, and the use of appropriate components of his first-aid/personal kit, for injuries caused by chemical agents of nuclear weapons.
- Practice a high order of health, personal hygiene and sanitation discipline as a protective measure against the spread of disease.
- Properly don protective clothing and be familiar with procedures for relieving himself/herself while wearing the clothing and properly perform assigned missions/tasks while wearing protective clothing.

Basic Operating

To meet basic operating standards of proficiency in NBC defense, a civilian must be able to perform the survival standards listed above and:

- Properly use individual protective equipment.
- Demonstrate an understanding of specific actions required of him by his unit's standing operating

procedures (SOP) for maintaining operational efficiency during and after NBC attacks.

- Recognize or detect chemical agent contamination and perform field expedient decon of the personal, clothing, personal equipment, and equipment that has to be handled.
- Recognize all standard marking signs that indicate chemically, biologically or radiologically contaminated areas.
- Cross or by-pass NBC contaminated areas with minimum danger to himself.
- Perform primary duties wearing the respirator/protective mask and protective clothing for extended periods. These periods to be determined by the commander based on equipment, job and environmental factors.
- Properly remove his contaminated protective clothing according to the fixed undressing procedures as outlined in SOPs or other (for example, national) regulations.
- Be familiar with effects of NBC weapons.
- Be familiar with the principles of collective protection, including shelter organization and operation where applicable.
- Demonstrate familiarity with the use of dosimeters.